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WEEK
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START
OF WAR
1939

BUSINESS WEEK



With Hugh Dalton and his Board of Trade, British industrialists plan to get the jump on postwar reconversion (page 15).

In This Issue:

Vitamins go to War
—A Report to Executives

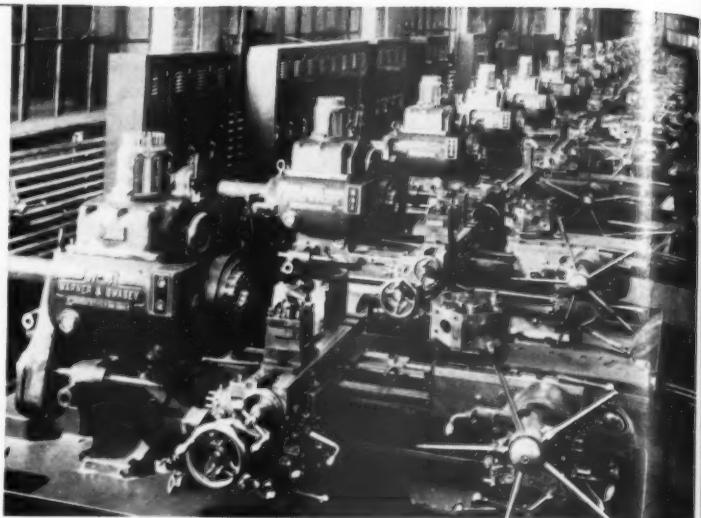
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DEX

PUBLISHED

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400,000 *Friends*



who will be waiting to give soldiers jobs

While American industry is intent on winning the war, it has an obligation to plan ahead—as the government is doing—so that victory will not be a mockery to those who won it.

The 400,000 machine tools built for war can be the best friends our soldiers have when they return someday. If these machines are distributed quickly *and wisely* from war plants to peace plants, they can start turning out the goods to meet dammed up demand. And in meeting it, they'll provide jobs without which that demand will dry up and so start a depression.

These machine tools are badly needed in thousands of American plants whose tools are old, inefficient, wasteful. These newer tools would help such plants turn out goods at lower costs—which broadens markets, makes workers' jobs more secure, provides more good things of life for more people.

Jobs and better living for all who will work efficiently... isn't that what everyone wants after the war? Then plan your machine tool needs now, so that you will be ready to provide your share of both those prizes of peace.

YOU CAN TURN IT BETTER, FASTER, FOR LESS... WITH A WARNER & SWASEY





How rubber prevents a building B-O-O-M

A typical example of B. F. Goodrich development in rubber

THE spark that jumps from your hand to the door knob when you cross a carpeted room could make a chemical or powder plant blow up. In factories, rubber V belts—like the one that turns the fan in your automobile engine—rub against the metal pulleys and build up this static electricity. Because rubber is an insulator and does not conduct electricity, the static stayed in the belts and built up until it was strong enough to jump—a spark. Then, if powder, chemical or gasoline was in the air—B-O-O-M! Unless belts could be made of some material that would let

the current flow away as it flows through a copper wire the danger of explosion would never be far away.

B. F. Goodrich development men went to work to change the very nature of rubber. They found they could add chemicals to rubber that would make it conduct electricity but made it too stiff to use. The problem became one of finding a rubber so soft that the added chemicals stiffened it to the exact degree for use. Finally they found the ideal combination. The result was a rubber compound that has *one billion times* the ability of ordinary rubber to carry electricity.

Belts were made of this new development and today these B. F. Goodrich static-discharging V belts are at work in powder and chemical plants all over the country. Here is another example of B. F. Goodrich development for war that will serve in peace, too—safer compressors in gasoline stations, and no static shock from your washing machine. And there are other uses that you might want to investigate for your product or plant. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.* 

B. F. Goodrich
RUBBER and SYNTHETIC products

Pop's mighty proud of the little lady!



Not long ago, many men would have raised the roof at the thought of their wives getting war jobs. They looked on it as an affront to their own earning ability . . . or a lowering of social prestige. That's not true today.

Patriotic women everywhere are turning out the tools of war, and patriotic men are proud of them. American women have pitched in, voluntarily, to ease the labor shortage. The fighting pioneer spirit of Molly Pitcher is glowing and alive in 1943.

Here at **SKF**, we welcome the many women who are helping us produce more ball and roller bearings. Those bearings will help put Hitler & Co. on the skids, and speed our fighting men along the Victory Road.



SKF
BALL AND ROLLER
BEARINGS

SKF INDUSTRIES, INC., PHILA., PA.

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WASHINGTON BULLETIN

WHAT THE WASHINGTON NEWS MEANS TO MANAGEMENT

Rolling Back and Forth

Explanation for the on-again-off-again performance of Congress on rollback subsidies is that the anti-Administration forces have a clearcut majority initiating legislation, but-without Administration help-they lack the two-thirds strength to override a Presidential veto. (Rep. Jessie Sumner is now proposing that a simple majority would be enough to lick the President.) Result: Neither the President nor Congress can claim a distinct victory; either has suffered a distinct defeat; or to the extent that the White House is unable to carry out any real policy, the Administration is genuinely the loser. A broad rollback program-of the sort that would knock down the cost of living by 5%-is dead.

Holes Left

Congress has not plugged every last hole. The President can still use subsidies to hold the cost of living where it is (in contradistinction to rolling it back) by such devices as government purchase of entire crops for resale at lower levels. But stabilization of this type can't trip up the 10% head start the cost of living already has on the little Steel wage rate formula. No. 2 drawback is that, if the President first allows wage rates to catch up with the cost of living, the latter may be boosted as much as 4%, enabling the unions to scream once more that they are behind the same old eight-ball (with regard to the increases in their members' take-home pay).

Farmers' Demands

Most important of all, the farmers, being practically certain of a smaller crop this year, want higher prices to maintain their "take-home" at last year's record levels. Under such circumstances, hold-still subsidies would have to be of enormous proportions to do the job. And Congress will balk at any big program. Right now, prospects for stabilization of a crop purchases are dubious, while prospects for higher farm prices are relatively good.

Fighting in the Dark

What worries some of the Jesse Jones people about his loud feud with Vice-President Wallace over Reconstruction Finance Corp.-Board of Economic War-

fare relationships is the possibility that Wallace is spearheading a concerted drive against the most conservative member of the Administration. It's probably not true that Roosevelt saw Wallace's first blast before it was issued, but Wallace undoubtedly believed he was expressing White House sentiment.

The Jones people are worried, too, by the evidence of War Mobilization Director James F. Byrnes' favoritism when Wallace and Jones were brought together at the White House.

Some of Jones' friends, on the other hand, think their boss actually sits all right with Roosevelt, that Wallace has been egged on in order to make him disqualify himself for the 1944 Vice-Presidency, freeing the New Deal from the embarrassment of having to toss him off the ticket; he has already suffered a bad public reaction from starting the fight.

And some cynics assume that the Administration's extreme right and left wings have been set to squabbling with a view to mutual self-destruction.

Tax Hearings Late

Like a man making a date with his dentist, the House Ways & Means Committee has booked work on a new tax bill as far down its calendar as it dares. According to the present timetable, hearings will start Sept. 8. New income taxes—if Congress can bring itself to pass them—will not take effect before Jan. 1, 1944.

Prodded by the Treasury, the committee has ordered its research workers to draw up blueprints for an excess profits tax on individuals. This is an alluring idea theoretically, but practical difficulties—such as defining war-created income and making allowance for hardship cases—are almost sure to rule it out.

Canners' Prices Set

Belated since January, the government program for pricing the 1943 canned vegetable pack now encompasses three plans:

(1) Consumer prices for the four major vegetables—peas, corn, tomatoes, and snap beans—were set at last year's averages by dollar-and-cents pricing regulations by grade, region, and can size;

(2) Consumer prices on asparagus, spinach, mustard greens, and turnip greens will be higher to reflect the inclusion of increased raw material and la-

bor costs in dollar-and-cents regulations;

(3) Prices on the rest of the vegetables will be higher by virtue of canner pricing on the basis of general formulas allowing cost increases.

Subsidies Promised

Economic Stabilization Director Fred Vinson approved price increases on the so-called minor vegetables on the theory that last year's averages for the major vegetables will hold the price line—or at least the price index—for the bulk of the canned foods bought by consumers. To support major-crop prices at last year's averages, Commodity Credit Corp. has promised to subsidize increased raw material and labor costs.

Ship Labor under Fire

Maritime Commission is coming under an inside attack for permitting shipyards to waste manpower. War officials concerned with utilization of labor charge that there's a ridiculously broad spread between the man-hours and time used per ship in the different yards—not only as between the new mass-production yards and the old-line shipbuilders but also among the new yards themselves.

Disregarding yards just getting started, they report a spread from 362,700 man-hours per Liberty ship in the most efficient of the new yards to nearly four times that in the least efficient. Spread in ships built per month per way is put at from 1.55 to 0.62. These officials argue that if all the yards achieved the efficiency of labor utilization of the best ones, 106,000 of the 344,000 men now working in Liberty ship yards could be released without reducing output or lengthening hours.

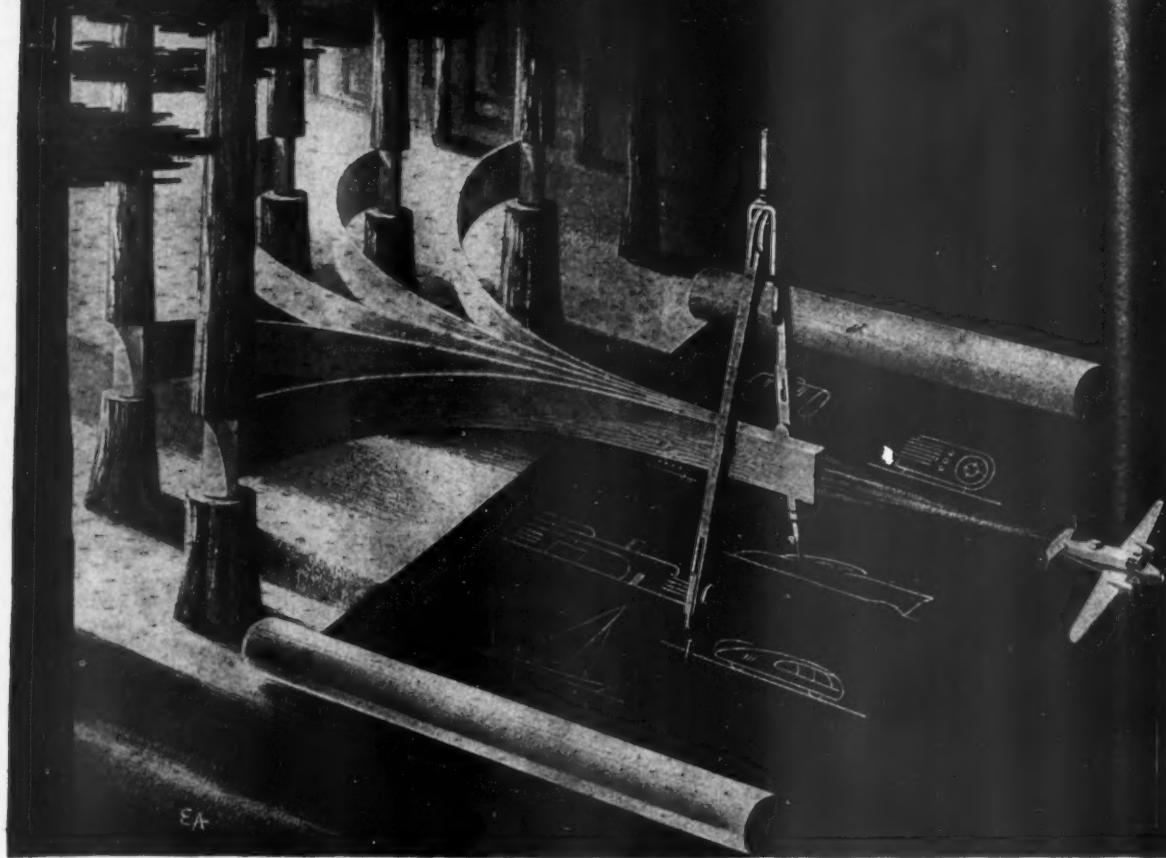
Maritime Commission has already forced changes in management of several lagging yards, but its critics think it could do more in the way of borrowing key men from the efficient builders to pep up the poor ones.

"Postwar Strike"

The first strike of consequence to be prompted by postwar considerations put a heavy hand on the war effort this week, and government labor officials worried lest it betoken a new trend of labor trouble.

Some 125 employees of the railroad that runs between the huge Bingham

THE TOUCH OF TOMORROW IN THE PLANES OF TODAY



A New Industry Comes Out of the Woods

Plywood, the structural material of the future, takes to the skies today. Planes of many types are now being made of plywood, superior in certain characteristics even to fine steel or aluminum.

With war-time expansion of plane production, Fairchild foresaw shortages in the light metals. Research and engineering development of plywood at Fairchild were given a great stimulus. New data and new techniques were developed, made possible by recently perfected adhesives. Plywood craftsmanship jumped ahead many years in a few short months.

By a patented Fairchild process, known as DURAMOLD, layer-on-layer of wood, laid cross-grain and permanently joined with special resins under heat and pressure, may now be molded into single and multi-curved structural surfaces of consistently high quality.

DURAMOLD possesses some distinct advantages over metal aircraft surfaces. It is more fire-resistant. It makes lighter, stronger planes; the rigid DURAMOLD shell is its own

support, eliminating the need for a great clutter of internal stiffeners, bulkheads, and other reinforcing members necessary in thin metal construction. It does not wrinkle or buckle in the airstream, as does a metal surface. There are no non-flush rivets, as no rivets are required. Thus, it is smoother in the air . . . horsepower is not handicapped by increased "drag." The plane can fly faster, is more maneuverable and has greater lift and range in the field of high-speed performance.

Production of DURAMOLD structures in spars, ribs, pieces, and complex curved surfaces is now concentrated within the aviation industry. Its purposes are 100% for purposes of war. But, when victory is won, the techniques, facilities and craftsmanship of a new industry can and will be applied to a multitude of peace-time products.

DURAMOLD, another example of those Fairchild achievements which put the "touch of tomorrow in the planes of today," is available to all "priority" manufacturers. Write for free illustrated booklet.

BUY U. S. WAR BONDS AND STAMPS

 **FAIRCHILD**

ENGINE AND AIRPLANE CORPORATION

30 ROCKEFELLER PLAZA, NEW YORK

Ranger Aircraft Engines Division, Farmingdale, L.I.

Fairchild Aircraft Division, Hagerstown, Md. . . . Burlington, N.C.

Duramold Division, New York, N.Y.

cut copper mine in Utah and two Copper Co. mills walked off their and the mills, which process a third of the nation's copper production, closed down. Federal officials moved in immediately to mediate. Wages, hours, union membership, grievances had no part in the walkout.

The strikers' sole demand was that they be considered employees of Bingham & Garfield R. R. and of the Utah Copper Co. Reason: during a postwar slack in the copper industry, they wanted to qualify for benefits under the Railroad Retirement

Who Told Truman?

The letter that Henry Kaiser's Foreign project manager, Chad F. Calhoun, wrote to Hiland G. Batcheller and Donald Nelson of WPB asking for more electric furnace capacity (BW-Jul. 3 '43), didn't carry any "cc to Hugh Fullerton" notation when it started, Calhoun says. Washington mystery now is: Who sent the copy of the letter bearing the threatening reference to Truman Committee counsel Fulton?

Product Debate

Elimination of the "B" products in the Controlled Materials Plan was an early objective when WPB Vice-Chairman Charles E. Wilson took over from the ousted Ferdinand Eberstadt. Manufacturers of B products get all their controlled materials direct from the industry division of WPB, while A product manufacturers have materials passed down to them from claimant agencies to prime contractors to subcontractors.

After several postponements, WPB decided to make a move in this direction for the first quarter of 1944. An order was approved and may be issued soon. On the other hand, it may not. WPB is getting some qualms and is giving the matter a second look. The order would leave only 22 of the present 333 product classifications on the B list. The others would be turned over to the claimant agencies instead of from prime contractors.

Afraid of Army

WPB worries about eliminating B products arise from a renewed fear of the extra paperwork for many firms—plus qualms about the wisdom of turning over so much authority to the Army. WPB now distributes directly some 5,000,000 tons of steel a quarter

to B products—about a third of the supply—but would be reduced to less than 1,000,000 tons under the proposed order. Army is pushing for the move, thinks that too much material is leaking away in B products.

Guffey Act Politics

Members of the House Ways & Means Committee who swung the vote against extension of the Guffey Coal Act thought they were taking a pot shot at John L. Lewis. Actually, neither labor nor the mine operators stand to lose much by this action right away. In wartime, all but 7% of the national coal output is selling above the minimum, and the economic pressure on wages is up, not down.

The Guffey Act—due to expire Aug. 23—set up a system of regional minimum prices for coal, based on costs of

production. Its purpose was to protect wage scales and keep the ordinarily hard-pressed coal industry from cutting its own throat by price competition.

Ways & Means always has been split over the Guffey Act, and the coal strike changed enough votes to give the opposition the whip hand. As a threat to labor, the committee's action is pretty weak—unless its removal of assurance that minimum coal prices will cover labor costs leads the mine operators to stiffen their opposition to wage increases.

New Paper Cuts

Secretive talks on paper shortages (page 34) ended temporarily this week in the issuance of WPB's Order L-240 for an additional 5% newsprint cut by newspapers and L-294 calling for elimination of one-third of gross paper and

Simplification Is Back Again

War Mobilization Director James F. Byrnes has ordered WPB's Office of Civilian Requirements to recheck minimum civilian needs and put in a big claim for critical materials for the fourth quarter of this year.

There's a string tied to the Byrnes order, however. After nudging OCR into asking for more steel, copper, aluminum, etc., Byrnes demands that the materials be used with utmost efficiency—meaning a revival of the simplification program.

OCR already is moving in that direction. Willis MacLeod, boss of OPA's Standards Division, has been called into OCR on assignment to comb out a list of industries—textiles among them—where simplification might stretch civilian supplies.

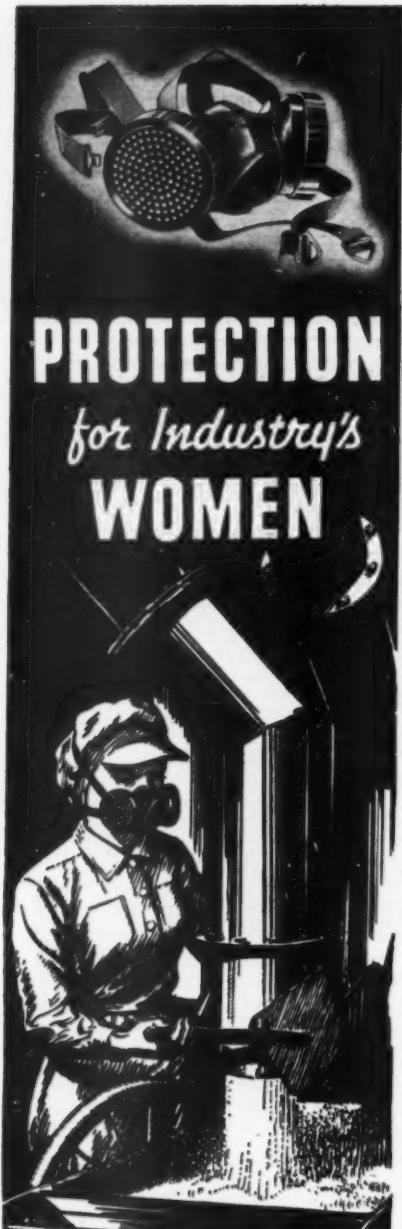
MacLeod's job is no cinch. Manufacturers are gun-shy of "regimentation," and WPB's industry divisions invariably have pooh-poohed widespread simplification as too much bother for what it's worth.

OCR is now casting about for some method to sugar-coat the pill. Words like "war model" and "utility drive" are taboo. General idea is to make the program voluntary. Manufacturers will be asked to observe loose quality standards and to concentrate production in middle-price lines. As quid pro quo, the complying manufacturers will get a bonus—probably longer profit-margins, or additional allotments of materials, or promises of manpower.

OCR's preoccupation with simplification is the tipoff that—despite Byrnes' order to ask for more materials—WPB's Requirements Committee shows few signs of being any kinder to the civilian. OCR will probably try some hard bargaining by putting in a request for 200,000 tons of steel for the next quarter, hoping to wind up with better than 50,000. By this cracker-barrel strategy, the agency hopes to avoid the fiasco of the third quarter, when it asked for a rock-bottom 50,000 tons and was pushed into the 30,000 substratum.

OCR now has a new batch of horror stories about shortages with which to impress the Requirements Committee. Some of them: Light bulbs are so scarce that show windows and display signs will have to be dimmed out; lack of mechanical washers and electric irons, coupled with the reduction in laundry service, is raising hob with civilian morale; packaging materials must be found at once, or shipments of furniture will come to a halt; durable goods inventories are at an irreducible minimum.

But nobody expects such stories to budge the Requirements Committee too far. Enough materials may be forthcoming to make a few washers and irons, but production of bigger items—like refrigerators—is out of the question. That'll have to wait for 1944.



As women willingly assume more hazardous jobs, they deserve—and are getting—every consideration for their health and safety.

Willson, leader among the makers of eye protective and respiratory devices, has engineered many special devices or adaptations for the ladies. Willson Respirator 570, for example, is particularly suited to women . . . protecting against metal fumes encountered in welding . . . toxic dusts . . . and acid mists. Your local Willson representative will gladly furnish additional information.

GOOGLES • RESPIRATORS • GAS MASKS • HELMETS

WILLSON
DOUBLE
PRODUCTS INCORPORATED
READING, PA. U.S.A.

paperboard used in display printing. However, demand for further cuts by all paper users can be expected later.

Meanwhile, the idea of using negro preachers to exhort men to cut more trees in the southern pulpwood districts is arousing hopes in WPB, but some alarm among other users of wood. Started by Frank Block, chairman of the War Activities Committee of the pulpwood consuming industries (who handled publicity drives for steel scrap and waste paper campaigns), it is aimed at increased pulpwood production only.

M. of M. Still Going

Although some congressmen thought the antistrike bill would outlaw maintenance of membership orders, the National War Labor Board is going ahead without missing a beat. This week, it ordered three war plants to write its standard union maintenance clause into their collective bargaining contracts.

The new law forbids NWLB to violate any provisions of the Wagner Act, but so did the President's original order setting up the board. If NWLB is wrong now, the lawyers say, it's been wrong all along.

New Enrichment Order

Plans for mandatory enrichment of all family flour with vitamins and minerals have been broadened to include forced enrichment of all white flour. Original plan was based on the belief that bakers would use plain flour, enriching their bread doughs by adding their own vitamin and mineral concentrates, while housewives would have to have enriched family flour to get benefits from the wartime food fortification program.

Under a Food Administration order, all white bread is supposed to be enriched. After checking up on the operation of their order, Food Administration authorities believe that the surest way to insure compliance by the bakers is to insist that millers make nothing else but enriched flour.

Survey Censored

Despite OPA prodding, the Office of War Information is sitting tight on a confidential survey which shows: that 36% of American families get the same income as before the war; that 23% get less; and that only 41% get more.

OWI fears release of the figures would prejudice the war bond drive. OPA would like to use them as an argument for tighter price control.

Afraid of Fathers

Anxious as manpower officials are to defer draft of fathers until the last moment, they don't want their hands tied. Thus they had some bad moments when the Senate Military Affairs Committee reported out Sen. Burton K. Wheeler's bill banning the father draft until 1945. However, the committee reported the bill only on the understanding that it won't be brought up until fall—and by that time anything can happen.

Some congressmen are so afraid of the repercussions when fathers start going that they are seriously considering a limited draft of women as an alternative. Army could use some 600,000 Wacs, has hardly more than a tenth that, and recruiting is slow.

Capital Gains (and Losses)

In spite of the talk about taking the teeth out of renegotiation of contracts, Congress has just extended it to cover contracts with the Reconstruction Finance Corp., Defense Supplies Corp., Metals Reserve Co., and Rubber Reserve Co.

Sen. Carl Hatch's bill to forbid political contributions by trade associations will pass, because no one who voted for the Connally-Smith bill forbidding union contributions can vote against it. But it won't make much difference: contributions from this source have never been large. Devices for getting around any kind of contribution restrictions have been perfected over many years.

Plans to release 275,000 pressure cookers to Victory gardeners this year (BW-Jun. 5 '43, p36) are falling short of the mark approved by WPB—may not come to more than 135,000. Since the end of April, 45,000 cookers have been distributed in the South and Middle West to take care of early crops.

OPA has decided that rumors of chiseling on doctors' prescriptions to obtain extra food stamps aren't worth bothering about compared to all the other black markets it struggles with.

Use of domestic clays, instead of imported bauxite, for making aluminum will get a boost from a clause in the new Interior Dept. appropriation earmarking more than \$2,200,000 for research, investigation, and operation of several "subcommercial" plants.

War Food Administration officials are worried about the Russian food situation. There are hints that not even the Russian Army is getting enough calories.

—Business Week
Washington Bureau

FIGURES OF THE WEEK

THE INDEX (see chart below).

	Latest Week	Preceding Week	Month Ago	6 Months Ago	Year Ago
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Steel Ingot Operations (% of capacity)	96.6	90.3	97.5	95.8	97.0
Production of Automobiles and Trucks	18,645	19,185	17,215	14,930	22,680
Engineering Const. Awards (Eng. News-Rec. 4-week daily av. in thousands)	\$8,701	\$9,903	\$12,474	\$11,325	\$38,914
Electric Power Output (million kilowatt-hours)	4,111	4,120	3,926	3,780	3,424
Crude Oil (daily average, 1,000 bbls)	4,008	3,955	3,933	3,871	3,297
Bituminous Coal (daily average, 1,000 tons)	767	2,017	1,990	1,714	1,888

TRADE

Miscellaneous and L.C.L. Carloadings (daily average, 1,000 cars)	81	81	80	73	80
All Other Carloadings (daily average, 1,000 cars)	45	64	62	48	63
Money in Circulation (Wednesday series, millions)	\$17,420	\$17,154	\$17,196	\$15,407	\$12,416
Department Store Sales (change from same week of preceding year)	+19%	+28%	+43%	+15%	-8%
Business Failures (Dun & Bradstreet, number)	66	60	56	105	186

PRICES (Average for the week)

Spot Commodity Index (Moody's, Dec. 31, 1931 = 100)	245.2	244.0	245.4	240.6	231.8
Industrial Raw Materials (U. S. Bureau of Labor Statistics, Aug., 1939 = 100)	160.0	160.0	159.7	156.6	155.0
Domestic Farm Products (U. S. Bureau of Labor Statistics, Aug., 1939 = 100)	210.3	208.9	208.4	196.7	181.1
Finished Steel Composite (Steel, ton)	\$56.73	\$56.73	\$56.73	\$56.73	\$56.73
Scrap Steel Composite (Iron Age, ton)	\$19.17	\$19.17	\$19.17	\$19.17	\$19.17
Copper (electrolytic, Connecticut Valley, lb.)	12,000¢	12,000¢	12,000¢	12,000¢	12,000¢
Wheat (No. 2, hard winter, Kansas City, bu.)	\$1.40	\$1.35	\$1.38	\$1.34	\$1.09
Sugar (raw, delivered New York, lb.)	3.74¢	3.74¢	3.74¢	3.74¢	3.74¢
Cotton (middling, ten designated markets, lb.)	21.07¢	21.11¢	21.14¢	20.20¢	19.83¢
Wool Tops (New York, lb.)	\$1.370	\$1.370	\$1.340	\$1.194	\$1.222
Rubber (ribbed smoked sheets, New York, lb.)	22.50¢	22.50¢	22.50¢	22.50¢	22.50¢

FINANCE

90 Stocks, Price Index (Standard & Poor's Corp.)	98.2	97.3	96.7	78.3	67.6
Medium Grade Corporate Bond Yield (30 Baa issues, Moody's)	3.85%	3.86%	3.89%	4.25%	4.32%
High Grade Corporate Bond Yield (30 Aaa issues, Moody's)	2.71%	2.71%	2.73%	2.81%	2.83%
U. S. Bond Yield (average of all taxable issues due or callable after twelve years)	2.27%	2.28%	2.29%	2.35%	2.34%
Call Loans Renewal Rate, N. Y. Stock Exchange (daily average)	1.00%	1.00%	1.00%	1.00%	1.00%
Prime Commercial Paper, 4-to-6 months, N. Y. City (prevailing rate)	1-1%	1-1%	1-1%	1-1%	1-1%

BANKING (Millions of dollars)

Demand Deposits Adjusted, reporting member banks	32,289	32,472	31,386	28,257	25,502
Total Loans and Investments, reporting member banks	45,843	46,147	47,182	41,467	32,382
Commercial and Agricultural Loans, reporting member banks	5,542	5,565	5,662	6,304	6,810
Securities Loans, reporting member banks	1,438	1,359	1,537	1,249	912
U. S. Gov't and Gov't Guaranteed Obligations Held, reporting member banks	33,295	33,631	34,317	27,832	18,232
Other Securities Held, reporting member banks	3,063	3,062	3,077	3,314	3,410
Excess Reserves, all member banks (Wednesday series)	1,210	1,300	1,630	1,656	2,259
Total Federal Reserve Credit Outstanding (Wednesday series)	7,576	7,194	6,535	6,428	2,873

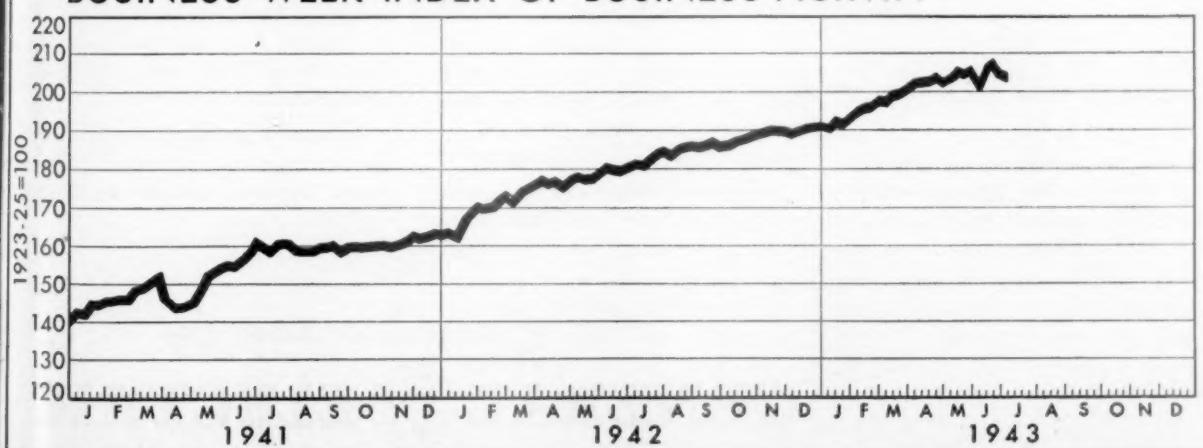
* Preliminary, week ended July 3rd.

† Revised.

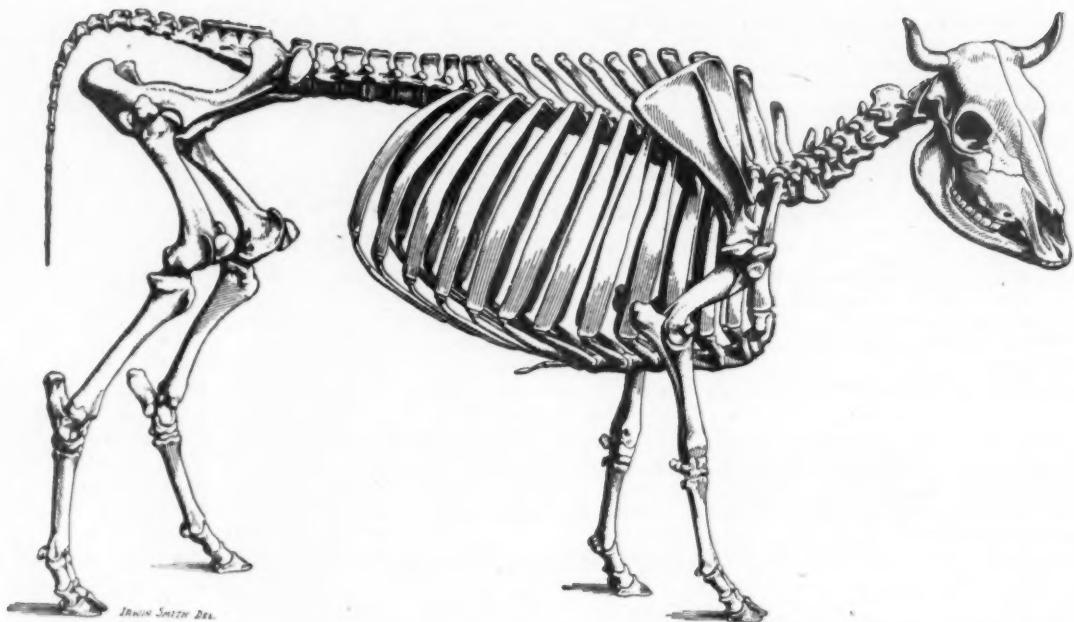
‡ Ceiling fixed by government.

§ Date for "Latest Week" on each series on request.

BUSINESS WEEK INDEX OF BUSINESS ACTIVITY



THE SKELETON OF A GREAT IDEA



Only 47% of a steer is edible meat. The rest is bones, gristle and other inedible materials.

In the past, meat has been brought to market in carcass form. Countless tons of inedible bones and surplus fat have been transported countless miles...by railroad, ships and trucks. An enormous waste of energy and shipping space!

Today, to save precious shipping space, meat is being shipped to our armed forces abroad de-boned and

de-fatted. The skeletons of the steers are being left home.

The U-boats made this change necessary. Modern, high-efficiency refrigeration made it possible.

Steaks and other de-boned cuts of meat are now pressed into compact blocks and refrigerated at low temperatures. Dependable refrigeration equipment has been provided by General Electric for this purpose.

To meet unusual war needs, enormous strides have been made in the

development of General Electric industrial refrigeration and air conditioning.

Equipment is more efficient, more compact, more flexible. When the war ends, these improvements will be applied to peacetime uses and made available to all . . . from General Electric.

General Electric Company, Air Conditioning and Commercial Refrigeration Division, Section 438, Bloomfield, New Jersey.

Air Conditioning by
GENERAL ELECTRIC

THE OUTLOOK

More Pressure for Production

Figures indicate war output rising again after earlier slump, but there is plenty of trouble ahead, particularly on manpower. Imports increase. Inflation front sagging.

With business ever searching for clues to the course and duration of the war, news from the fronts took the outlook into the light once again this week. Only such new battles as those in Russia and the Pacific can the imponderables of strategy, weapons, and economic potentials be finally weighed. Already this year, sea war in the Atlantic, air battles over Europe, and ground fighting in Tunisia have changed economic prospects as well as military plans.

Experience Data Coming

In the Pacific, we shall soon know better what time lag to allow between defeat of Hitler and victory over Japan. And, regardless of how high the Nazis are aiming, development of the new Russian campaign will further clarify how, as well as how long, we fight in Europe—which types of weapons we shall require, and in what quantities.

Of course, that will remain only one side to the munitions picture; the other will be our capacity to produce. Donald Nelson confirms the news that total munitions output failed to gain in May over April and lagged further behind schedule; planes were up, but other categories down. A 5% gain over May in daily war expenditures, however, is evidence that the uptrend was resumed in June. Nonetheless, arms are not coming off assembly lines quite as fast as had been hoped, and pressure for more will step up in months to come.

Manpower Hitch

Worst hitch from now on will be manpower, indirectly where not directly. War Manpower Commission estimates new requirements for the armed forces and war industries in the next year at 3,600,000 as against fulfilled needs in the year just past of almost 2,000,000.

That comparison only seems favorable. In the last twelve months, we put most 2,000,000 unemployed to work, and unemployment now is at irreducible levels. Also, we drew on the nearly 1,000,000 oldsters, youngsters, and housewives most easily induced to enter the labor force. WMC figures assume for next year an expansion of only 1,300,000 persons. To fill the 1,300,000 gap, we must transfer 1,300,000 persons to be released from con-

struction, trade, and service jobs because of lack of materials, and 1,000,000 others to be taken from "less essential" employment.

The balance sheet assumes that each need as to job, industry, and location will be fulfilled. Actually, such is the distribution of skills, wage rates, and labor supply that some low-priority needs will be met, and some high-priority ones not met. What's more, total requirements will be higher if three WMC assumptions are not borne out: (1) that the armed forces will total only 11,300,000 in July, 1944, (2) that casualties will be negligible, (3) that productivity will rise.

Increased Imports

The better-than-expected easing in shipping (BW—Feb. 20 '43, p108) is permitting the expected rise in imports (BW—May 15 '43, p13). Increases in coffee, cocoa, and sugar supplies have already been announced. The War Food Administration now says that soap ra-

tioning has become unlikely because of larger shipments of fats and oils from abroad. Renewed imports of burlap will permit some reconversion of cotton textile mills from bagging and sheeting to civilian fabrics in the fourth quarter.

These publicized gains have, no doubt, been preceded by larger shipments of strategic critical materials previously stockpiled at various foreign ports. And, steps to restore some private foreign trading, first with Africa, are already under way.

Retail Prices Rising

Developments on the inflation front still hang on Washington decisions. Yet, farm prices are holding steady, three months after the hold-the-line order. Not so retail prices: A New Dept. of Commerce index shows a 2% rise between March and May, and an 8% advance over 1942 "freeze" levels. With excess purchasing power still operative, congressional cuts in funds for machinery to enforce ceilings suggest higher living costs to come.

Wage stabilization under hold-the-line is proceeding slowly. Regional war labor boards are gradually getting around to defining the level below which a wage rate results in substandard living. But the boards are moving at a snail's pace towards defining "minimum going wage rates" for specific occupations.



The decline in consumer goods inventories is moderating; little cushion for living standards is left. Business must maintain a physical minimum stock of goods to cover normal operations, and that rock bottom has just about been reached. Dept. of Com-

merce analysts had figured that liquidation would slow down in the second quarter; the curves now bear them out. Current inventory levels are inflated by price gains, and nondurable producers need still larger stocks to sustain stepped-up output.



NO CUSTOMERS

Along highways of the gasoline-starved East Coast, boarded-up service stations, roadhouses, and restaurants

(BW—Jun. 19 '43, p60) display terse notices of their demise. At Williamsburg, Va., however, the proprietor of a drive-in movie adds grim humor to his business obituary.

Army's Oil Front

New fuel division looks as if it is out to get oil by more ways than just buying it. Includes operating talent.

On Washington's oil front it is now believed that the Army was preparing for something more than the purchasing of petroleum supplies when it recently formed the Fuels & Lubricants Division in the office of the Quartermaster General.

• **Impressive Setup**—The first job of the new division is in procurement, but the organization chart indicates something more far-reaching. There are such branches within the division as plans and liaison, technical, planning, requirements, operations and control. There are officers in the branch, some from civilian life not long back, who are experienced in petroleum geology, field engineering, and oil production.

The director of the division, Col. W. E. R. Covell, is an engineering officer, West Point and Massachusetts Institute of Technology. He is not experienced in petroleum but has been in charge of engineering projects of considerable size for the Army. His deputy, Lt. Col. Jay L. Taylor, is a Texan, widely experienced in oil field engineering.

• **Somervell's Hint**—Recent testimony of Lt. Gen. Brehon B. Somervell, com-

manding the Army Service Forces, was illuminating. His assertion that the Army fears a shortage in domestic crude oil supply was widely publicized, but other statements of significance received little attention. He told a Senate subcommittee on appropriations late in June that our oil production must be supplemented from other sources and that the most available sources were Colombia and Venezuela. He did not mean imports entirely, for he spoke of the construction of additional refining facilities in those countries, the production from which would be "readily available through the Panama Canal to the South and Central Pacific areas."

A possible connection is seen between new construction mentioned by Gen. Somervell and the activities of the Petroleum Reserves Corp., announced July 2. This is another of the Reconstruction Finance Corp. brood, and it is to operate in petroleum outside the United States. Its stated purposes cover such activities as producing, refining, construction, buying and selling of petroleum and products, and even the acquisition of stock in existing petroleum companies.

Gen. Somervell also revealed that greater supply from the fields of Iran, Iraq, Kuwait, and Saudi Arabia is counted upon. He said that production in greater quantity than is now being taken is available and "justifies an increase of at least 200,000 barrels in refining facilities in the general Persian Gulf-Mediterranean area." The additional supply, he reported, would be

available not only to the Mediterranean area but also to the areas east of the Persian Gulf.

• **To Resow Scorched Earth**—Unauthenticated reports concern preparations by the Army for rehabilitation work in enemy-held oil fields, looking to the day when they shall have been recaptured. Preparations are said to include planning for equipment for both producing and refining. It is assumed, of course, that such fields as have been restored to production by the Japanese will again be demolished when they are forced to withdraw. Included in the personnel of the new Fuels & Lubricants Division are drilling and development specialists.

The Army recently made official announcement of its Far North oil venture, in Canadian Northwest Territories, on the Mackenzie River. A refinery is to be built at Whitehorse, in Yukon Territory, and 600 miles of pipeline will connect the refinery with the field (BW—Apr. 17 '43, p28).

• **Revealing Figure**—Army's petroleum activities are based in part on the availability of oil nearest to the combat zones and in part upon its expressed fear that domestic production will not be sufficient. Its recently announced figure of 1,000,000 bbl. as the daily requirement for the U. S. military program, not including aviation needs, is the key to its greater activity in augmenting supply.



UMBRELLA MEN

Festive spot in busy California ship building yards is "Calship Beach," sun-broiled deck of the corporation's 225th vessel. Anxious for a bit of shade to compensate for their hot, stuffy helmets, glaring torches, and reflected solar rays—welders raise gay beach umbrellas, ignore taunts of fellow workers, and keep a little cooler.

Britain Plans Reconversion

Business men start with government agency on survey of wartime changes, of what must be done to get back into peace production, of how soon that can be done after war ends.

LONDON—With no fanfare and not the slightest deviation from the colossal task of keeping war production at present record levels, the Board of Trade, assisted by a handful of British industrialists, is quietly launching England's first practical effort to draw up a concrete pattern of postwar industrial reconversion.

• **Business Groups Active**—The move, which has not yet been formally announced by Hugh Dalton, president of the Board of Trade, follows six months of agitation by such prominent organizations as the Federation of British Industries, the British Employers' Confederation and the Trades Union Congress for a postwar plan and by Prime Minister Churchill's radio appeal on Mar. 21 that industry peer through the mists of the future to the end of the war and be prepared by ceaseless effort and forethought for the kind of situations which it is then likely to face.

The project just getting under way is a plan to survey every major industry in Britain in order to determine: (1) the principal problems which must be solved by each industry in order to reconvert to a peacetime basis; (2) the probable condition of all equipment at the end of the war; (3) the technological improvements which have been introduced during the war and how they will affect the resumption of peacetime production. It is an attempt to gain a clear picture of what the war has done to different industries

and to evaluate the major difficulties which must be solved in their transition to peace.

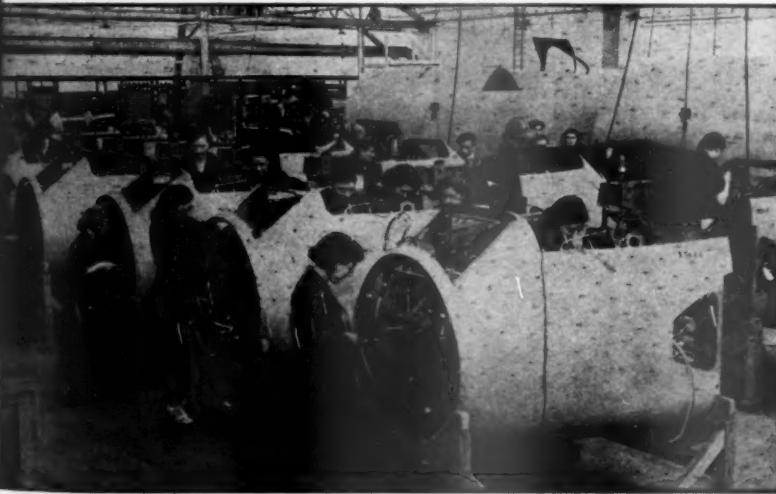
• **Information Wanted**—Eight groups of questions have recently been mailed to leaders in 50 key industries. Here is how they shape up:

Roughly what proportion of the firms and capacity in your industry are wholly or mainly engaged by government contract or subcontract? On the production of goods not wholly produced by the industry, what are the difficulties likely to be encountered, once the contracts expire, in restoring factories quickly to their peacetime production and how may these difficulties be overcome? Has the industry any special problems in particular localities? This involves a review of the problems of the factories that are now engaged in munitions contracts, an estimate of the time required for changing back to peacetime production and for restoring machinery taken down or moved, and the extent to which the plants in your industry are likely to be unbalanced at the end of the war.

To what extent has the capacity of your industry been increased during the war and what prospects are there of employing the additional capacity after the war on peacetime goods?

To what extent can the industry be occupied in making parts or goods for stock while factories are being changed back from war production?

What are your views about priority of release from military service and from other kinds of national service of special classes of pivotal workers upon whose return will



Sir Stafford Cripps, Minister of Aircraft Production, estimates that as little as 10% of Britain's present plane plant capacity will find peacetime markets. Other problems, such as which

key workers should be demobilized first from military service and what to do about the emergency work army (mostly women), also are being studied today by British manufacturers.

WAR CORRESPONDENCE

This first comprehensive report of nation-wide postwar planning by British business men comes by radio from Business Week's Foreign Editor, now heading east again on a trip of indeterminate length and time, with an assignment to report to American business management on war trends affecting its present activities and shaping its future.

He travels as an accredited and uniformed war correspondent, recognition by the armed services of the part that the production line plays in this total war and of the importance of adequate reporting to the key men on that line.

First stop was England, for interviews with the men of industry and of government, and a look beyond the present British economy which he charted in a series of Business Week reports a year ago under the title, "Lessons from Britain."

Further articles will come from this stop and from others south and east. Final assignment for the Foreign Editor's trip will be to bring home a series of Reports to Executives on the economic changes now under way in the Old World that are bound to affect the American business man's part in the cooperation of war and the competition of peace.

depend the employment of other workers?

Can you give any information as to the probable condition of allied industries which normally supply you with semimanufactured material or perform subsidiary processes in connection with your products and on the extent to which the rapid restoration of your production is likely to be affected by that condition?

Have substantial orders for postwar delivery already been received?

Do you wish to make use of any government-built factories established in your industry either as an alternative or as an addition to your existing facilities? Are there any other government factories you would like to acquire?

How many workers—men and women—did each of the main sections of the industry employ immediately before the war, and how many men and women does each of these sections expect to be able to employ twelve months after the end of the war?

• **Lining Up Equipment**—To provide information on the probable state of capital equipment in each industry at the end of the war, the survey sponsors are undertaking an industrial census on a scale far more comprehensive than many of the industries have ever attempted before. In a few lines, such as machine tools and textiles, fairly detailed information is already available;

but in most of them, four groups of questions, if fully answered, will give the leaders who are attempting to work out a practical plan of operation more data than has previously been available at one time. These questions are:

Are the plant and machinery of your industry modern and up-to-date and suitable for making peacetime products? If new machine tools have been acquired by the industry in order to manufacture war materials, are they adaptable for making the customary peacetime products and are others available which can be adapted quickly?

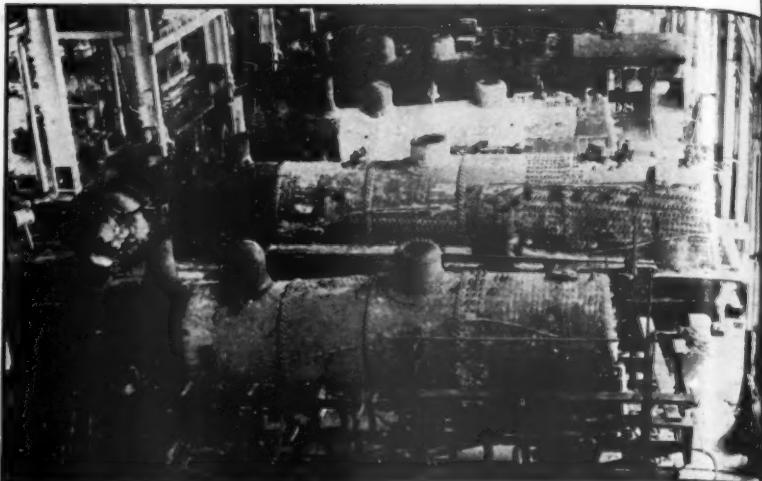
What is your estimate of the probable demand for repairs to machinery expressed as a percentage by volume of your demand in 1938 or by value at prewar prices?

If your plant and machinery are not wholly modern and up-to-date, state generally the age of the machines and the degrees of obsolescence. Also indicate the machines most in need of replacement. What is your estimate of the total value at prewar prices of machines required for replacement or substitution? What are the chief types required?

If it were proposed to scrap old machines and replace by new, could this be done for part of the plant while maintaining production in the rest of the plant, reconditioning old machines if necessary in order to do so? If it is proposed to remodel and modernize your existing plant, give particulars.

Machines Wanted—Following this last question, the survey makes a pertinent postscript. "Remember, in answering these questions, that, while the re-equipment of British industry with up-to-date plant will be an important task during the reconstruction period, the country's machine-building capacity will, for some time after the war, be inadequate to meet all the demands on it. Therefore, although scrap metal is urgently required now for war purposes and redundant machinery should in consequence be scrapped, it would be short-sighted to scrap useful machinery which is likely to be able to operate economically in the immediate postwar years, unless it is probable that it can be replaced by more efficient machinery."

Wide Differences—Until replies begin to come in, no executive or government official will venture any guesses on what conclusions can be drawn from the survey. Almost every industry faces a different set of circumstances. Barely 5% of the present output of textile machinery plants is in normal lines, since nothing but replacement parts can now be manufactured for peacetime equipment. The remaining 95% of capacity is turning out munitions and other war supplies. Many industries including carpet and lace manufacturing have stopped completely for the duration. But airplane production has been built up to the point where it employs 2,000,000 workers, and Sir Stafford Cripps, Minister of Aircraft Production, predicted publicly a few weeks ago that peacetime production, even in an air-minded world, will not absorb more than 25% of present plane manufacturing capacity and



BONEYARD HOGS

While American farmers have an abundance of hogs (BW—Jun. 1943, p15), railroaders can't find enough. In railroad language, a hog is a locomotive sorely needed to haul heavy

possibly as little as 10%. (Lord Brabazon, his predecessor, later pointed out that, since the aircraft industry is now at 60 times its peacetime size, 10% would still be six times what it was prewar.)

The industrial leaders who are behind the present survey have more in mind than a mere return to prewar manufacturing conditions. Sir George Schuster, a member of Parliament who has an alert interest in Britain's industrial efficiency after the war, has created a stir among business leaders by an article in The Times in which he declared:

"We dare not rest comfortably on the idea that what British industry has accomplished in war gives assurance that it will start off to tackle its postwar tasks better equipped relative to other countries than it was in the prewar period. True, we shall, in our engineering industry, have more machine tools and presses and many more people trained in the semiskilled processes of operating them, but there has been no similar improvement in the equipment of basic industries such as coal and iron and steel. And in both basic and engineering industries, other countries including India, Australia, and South Africa have made a still greater proportionate advance."

Starting Gun—Britain has been as reluctant as the United States to divert any of its energies away from the production battle to the problems of postwar readjustment, but just as determined to do a sound planning job when the time is ripe. The survey which has been launched so unostentatiously during the last few weeks is the first sign that British industrial leaders have decided it is time to lay groundwork for the ambitious job ahead.

war traffic. Thus the roads are digging deep into "boneyards" where decommissioned engines awaited junking. At Tacoma, Wash., Northern Pacific is renovating its "boneyard" stock—some 40 years old—for service again before junk yards call

For Un-Stockpiling

In pulling out of cork after the North African victory, government gives preview of its postwar liquidation job.

Reduction of the government's cork stockpile to about two-thirds its present size may turn out to be a preview of postwar policy for liquidation of surplus supplies.

For the first time, the Defense Supplies Corp. has started trimming down one of its big stockpiles, instead of scouring the market for additional quantities. In the process, it is getting a forecast of some of the problems government and industry will face at the end of the war.

Campaign Result—The decision to cut down the reserve supply of cork followed the windup of the North African campaign. This put annual production of around 63,000 tons directly under control of the United Nations and opened the way for additional imports to be brought in from Portugal and Spain which ordinarily produce about 200,000 tons a year.

Originally, the Cork & Asbestos Division of the War Production Board set its sights on a stockpile big enough to supply essential needs for three years—though that objective was never actually reached. Now that the import situation has cleared up, the division will settle for a one-year's reserve, provided that domestic users of cork maintain

an equal amount in their inventories. • **Half and Half**—This arrangement insures an over-all stockpile big enough to meet two years' essential needs, half of it carried by the government, half by the trade. As long as the industry keeps its inventories up to the prescribed level, WPB will let it operate under a loose system of allocations that puts comparatively few restrictions on the use of cork. Several officials think this 50-50 split provides a convenient pattern that may be followed when the time comes to taper off stockpiling of other strategic commodities.

As things now stand, manufacturers are free to use cork for just about any purpose they choose as long as they stay within their over-all allocations, which are pretty liberal. About the only important exception is beverage caps, which still are limited to save metals. Theoretically, cork is now available as a substitute for other materials, but the surplus supply isn't large enough to permit any big-scale substitution for plastics or metals.

• **Will Ease It Out**—In bringing its reserves down to a one-year supply, DSC will dispose of roughly one-third of its present stockpile. With the cork market in fairly comfortable shape, this is too much to throw on the counter all at once. DSC has decided to feed it out slowly in small batches that won't jolt the existing price structure. Its plan is to call for bids periodically and accept all offers close to the going market price. Handled on this basis, all the surplus stock should move out into private hands within a year. Most of it will be

used as soon as it is sold, because the trade's inventories already exceed the minimum prescribed by WPB.

DSC is pretty sure to take a loss on its cork sales, but this is no more than it expected. The stockpiles were built up at a time of scarcity and high prices. If they are liquidated on a normal market, there isn't much chance of getting the original prices. However, as long as the government sticks to a policy of slow and orderly disposal, there isn't much danger of breaking the market or touching off a sellers' panic.

Roll Their Own

Cincinnati machine tool builders, now that the market is glutted, convert their product to making of direct war goods.

Growing might of the United Nations soon will get additional strength from the sinews of the Cincinnati area's giant machine tool network that gradually is being converted to the direct manufacture of the stuff with which battles are fought.

Latest Queen City firm to announce that it has begun the conversion process is the Cincinnati Milling Machine Co. which sprawls for acres over suburban Oakley. Previously, the American Tool Works downtown and the R. K. Le-Blond Machine Tool Co., another suburban plant, had begun to use for the manufacture of vital war goods the ma-

chines they had been building in huge volume for contractors working on war orders.

• **Realistic Approach**—The conversion is on a limited scale only but signalizes a realistic approach to a problem that has been bedeviling machine tool plants in the Cincinnati area for months. Pitching in almost from scratch at the war's start, the Cincinnati plants had a monumental job to do.

Orders poured in at a rate that amazed even the veterans who had experienced the hectic, hell-bent-for-victory production schedules of the World War. Yet, even in the whirl of activity following Pearl Harbor, machine tool executives foresaw the time when orders would taper off and when layoffs in the midst of an all-out production-for-victory program would have an adverse effect on morale. And they sought to guard against the possibility of idle machine tool employees while the rest of the community kept busy making direct war goods, such as shell casings, airplane engines, and gun parts.

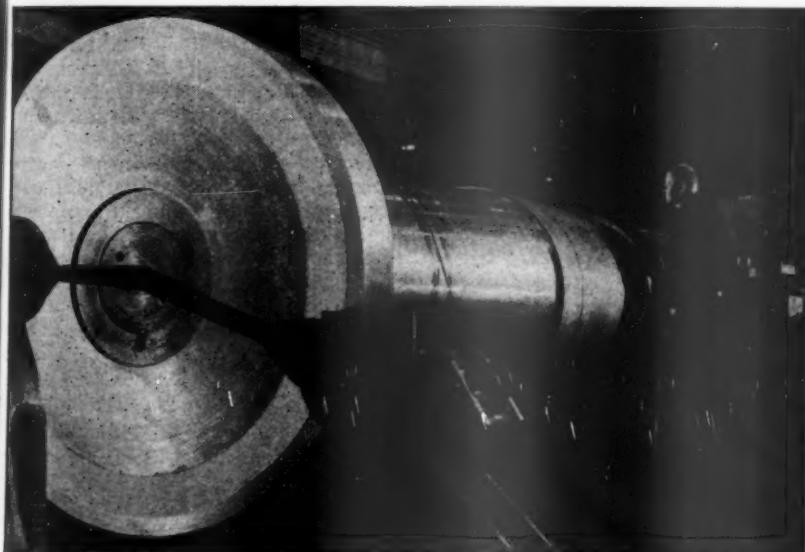
• **Pattern of Change-Over**—The government nodded encouragement to planning. While identity of the war goods which Cincinnati plants now are making is a military secret, an example of the conversion process will illustrate the pattern of change-over.

Plant X has been making lathes. In the past several months, it has been catching up on orders, the backlog dwindling steadily. Now orders are scarcer. Lathes have been furnished most plants and units of the armed forces needing them, or there are in reserve enough to take care of replacements. To sidetrack layoffs, plant X now has begun using its own lathes to make rifle barrels. That is conversion from manufacture of tools for armament plants to actual manufacture of armament.

• **Association Points Way**—The National Machine Tool Builders Assn., whose chief is Walter W. Tangeman, vice-president of Cincinnati Milling Machine, last week put its finger on the necessity for immediate conversion, at least on a small scale. "Unlike munitions, machine tools built for war purposes are not expendable," the association stated in an illustrated publication, *Machine Tools*.

The association compared the future faced by the machine tool industry to that the automobile industry would confront if, during the war, it was flooding the country with 10 to 20 times the number of autos used in peacetime. After the war, there would be no market for new autos.

• **Postwar Tools**—Since 90% of the machine tools built for war purposes can be used in peacetime industry, the association saw as the industry's chief hope the design and manufacture of new machine tools to catch the eye of manu-



GIANT SPOOL

On a huge lathe at the East Pittsburgh Westinghouse works, an operator puts final turns on a 75-ton, steel generator coupling shaft slated for

Grand Coulee Dam. The big "spool," measuring 4 ft. across, will transmit kinetic energy from a hydroturbine to a 108,000-kw. generator. Four of the nine generators ordered for Grand Coulee already have been delivered.

facturers in a highly competitive post-war market.

But the conversion process is seen as a more immediate solution. Involved in the machine tool manufacturers' decision to convert was organized labor's persuasive urging that steps be taken to prevent layoffs. C.I.O.'s United Auto Workers descended on Cincinnati about two months ago to stage a rally at which spokesmen turned the searchlight on the layoff bogey.

• **More Conversions Coming**—Machine tool executives discreetly declined to comment on the plaint, but the union can take comfort from realization that conversion now is being introduced, and indications are that still other Cincinnati machine tool plants will be into such a program more extensively before fall.

GOT YOUR ANTIFREEZE?

Hard as it is to worry about freezing auto radiators in July, car owners may tuck away a pleasant thought for respite next autumn—there will be plenty of ethyl alcohol and it will be generally distributed. Even now garages are stocking up under pressure from WPB which doesn't want to see last November's scarcities repeated.

There will be no "permanent" antifreeze mixtures of the ethylene glycol group (Prestone, Zerex, etc.) available for civilian use. The military and some buses and trucks will get it all. There will be no synthetic methanol (Zerone, etc.) because shortages of this chemical have resulted from demands for it in the making of formaldehyde plastics and other vital war uses. The ban on selling aqueous solutions of inorganic salts, which were found to be harmful to motors, will continue.

Detroit's Big Job

War production now is at rate of eight billion dollars a year and going up; changes in program cause upsets.

Automotive industry production today stands at an eight billion dollar annual rate and is going higher. Employment exceeds 1,200,000 salaried and hourly workers. These are the latest figures out of the Automotive Council for War Production, representing 825 member vehicle, body, and parts plants.

• **Looking Ahead**—Dollar volume thus stands at nearly double a normal peacetime figure, and employment is up around 75%. And there lies ahead dollar volume above ten billion; employment will approximate 1,500,000 next spring. Those projections mean problems, but they'll be solved.

The first problem is shifting goals in war production. Tank arsenals are still going through a declining phase, first induced by lack of shipping space, later by diminished battle needs. A few tank plants have closed; many have cut off a shift; all have reduced their schedules.

• **Reflects Tactics**—The same holds true for gun plants, particularly in antiaircraft categories and in some machine-gun shops. Tactical needs simply thinned out after the record production of past months.

Most truck plants are past their peak on military vehicles; they even have enough idle equipment to permit some civilian goods output (BW—May 29 '43, p52).

The aircraft engine program is ahead of schedule today at some plants, with

motors piled up awaiting airframes. A few major engineering changes are being made. The upshot is that some engine plants are in cruising gear rather than at top speed, while others are momentarily laying off men as prime contractors make changes which slow their lines for a time.

• **Others Push Up and Up**—On the other hand, the general aircraft program is enlarging almost by the day. New production facilities are coming in, and so is added tooling in the previously established plants. Invasion boat output is at consistently high levels, and ship and naval parts programs are still augmenting.

These shifts provide difficult problems in manpower and materials. Aircraft Plant A, increasing schedules at City One, doesn't get any dividend in manpower by reason of the fact that Tank Plant B, in City Two, is laying off.

• **The Manpower Needs**—The auto industry expects to reach peak employment next year, though many plants have already passed peak. Detroit itself figures it will need 198,000 more men and women by next spring, including 65,000 replacements for draftees if Army needs continue steady.

Women will provide the bulk of the enlargement of the industrial army. Today they represent 20% of total payrolls; next year some plants expect women to account for as much as 75%.

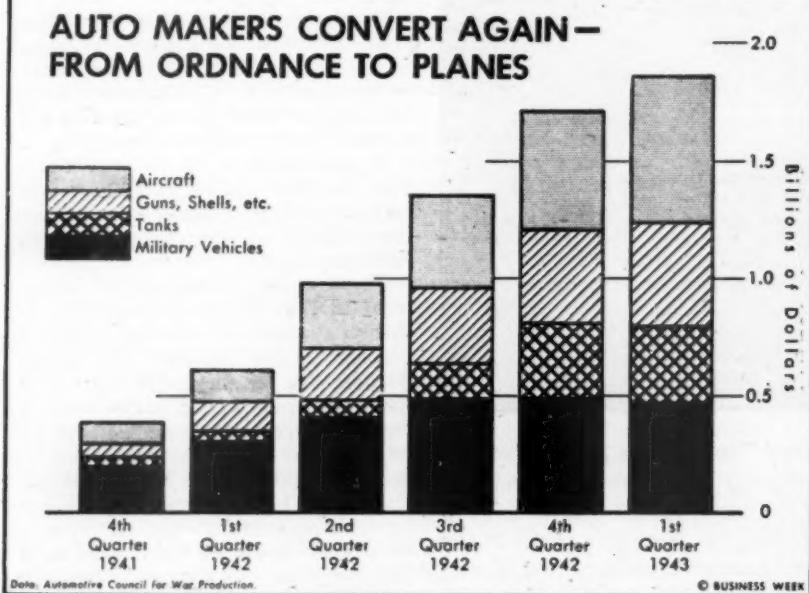
• **Changes in Steel Needs**—Materials no less than manpower are involved in production changes. The curtailment in tank production reduced the needs for armor plate, but the slack was instantly taken up by call for more and more ship plate. Ship plate does not carry as much inherent ballistic resistance as armor, so the change quite likely meant some modest shift to lean alloys and a little relief for overcrowded heat treatment facilities.

Greater pressure for aircraft parts naturally has heightened the load on aluminum and magnesium. Aluminum forging and extrusion facilities are, if anything, farther behind demand than at any time during their hand-to-mouth war history. Other shapes are fairly readily available, however. Magnesium, thanks to recent additions to facilities, is rather handy.

• **Copper Scarcity Persists**—But copper, despite supply-induced changes in cartridge cases to steel, remains tight due to consistently heavy Navy needs.

But the problems are not insoluble. Manpower shortages have been around a hypothetical corner for six months and are still months away. (Gradually some observers are swinging to belief that the corner may be a mirage.)

Materials will continue to turn hair toward gray, but the Controlled Materials Plan is working better, say purchasing agents, and the broad, long-range program will be conquered.



Planes of Wood

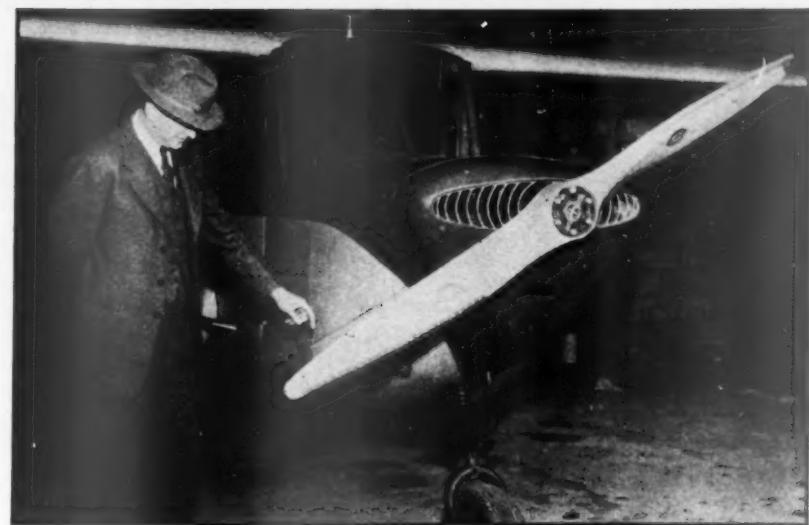
Acquisition of General Aircraft's Skyfarer by Grand Rapids Industries puts furniture men into plane business.

For many years the name Grand Rapids has been synonymous with wooden furniture. During the past year, the imprint of Grand Rapids Industries, Inc., has been appearing on parts for Army gliders and light aircraft. In the future, the same trademark will turn up on the Skyfarer airplane, a design declared "spinproof" by the Civil Aeronautics Administration before its production was interrupted by the war.

• **All Rights Acquired**—Grand Rapids Industries, Inc. (BW—Dec. 19'42, p46), is unique in that it is a corporation formed by 15 furniture manufacturers, headed by Frederick H. Mueller, former president of the National Assn. of Furniture Mfrs. Announcement of G. R. I.'s acquisition of all the patent licenses, finished planes, and parts inventories of General Aircraft Corp. of Lowell, Mass., was made at an Independence Day "Wings for Victory" celebration at Grand Rapids Airport.

The Skyfarer was designed for General Aircraft by Prof. Otto C. Koppen of Massachusetts Institute of Technology. It embodies many of the latest developments in simplified control for private pilots of limited flying experience. It is a two-passenger plane powered with a Lycoming 75-hp. engine.

• **Trend toward Wood**—Even before our military aircraft production program threatened to outgrow the supply of light alloys, there was a trend toward the more extensive use of wood in the construction of small aircraft. The development in the plastics field of more effective bonding materials for laminated wood and plywood and new



For military use now, for air-minded civilians after the war, the single-motor, two-passenger Skyfarer is to go into production at a plant on the Grand Rapids airport. Behind the venture are 15 furniture manufacturers.

methods of molding and forming created new opportunities for wood to compete with metal.

Aeronautical engineers took these ideas back to their laboratories, and several designs in which wood was the predominating structural material were ready for production just before the war began. Then plywood became critical, and plans were laid aside.

• **Andover Kent's Langley**—Of the same vintage as the Skyfarer is the Langley four-passenger, twin-engined aircraft to be produced by the Andover Kent Aviation Corp. of New Brunswick, N. J.

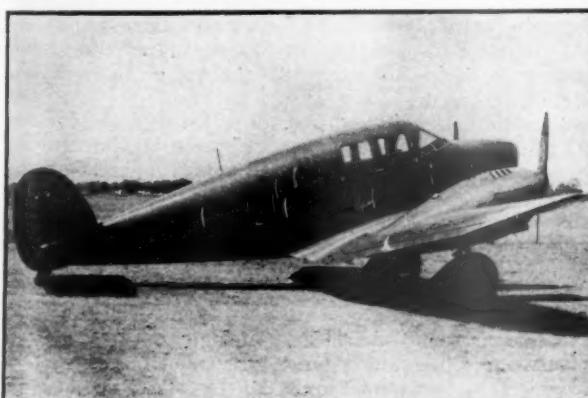
Pioneering work in molded plywood has been under way for nearly a decade by the Duramold Division of the Fairchild Engine & Aircraft Co., the Bristol Co., and by Eugene Vidal, who, as chief of the old Bureau of Air Commerce, sponsored the low-cost light plane program and later devoted his energies to the development of the

molding process that bears his name.

• **Caravan Almost All Wood**—Probably the most ambitious use of wood in the structure of a large aircraft has been made by Curtiss-Wright in the huge C-76 or Caravan, designed during the war and now in production as an Army troop transport at Louisville, Ky. Similar in dimensions to the all-metal Curtiss Commando (C-46), the Caravan has a wing span of 108 ft., a length of 68 ft., and is powered with two 1,200-hp. engines.

The Caravan was developed and first flown at the St. Louis plant of the Curtiss-Wright Corp. Jan. 5, 1942. It is basically an all-wood plane, utilizing molded plywood, laminates, and lumber.

• **Two-Thirds Subcontracted**—More than two-thirds of the Caravan's production is subcontracted to the wood industry in an effort to utilize facilities outside the aircraft industry. Chief among the subcontractors is the old



Perhaps the most ambitious molding of wood into large aircraft has been by Curtiss-Wright in the big Caravan (right). In comparison is Andover Kent's four-passenger

Langley (left), same vintage as the Skyfarer to be produced in Grand Rapids by a group of 15 furniture makers which acquired patent rights from General Aircraft.



NELSON EYES STEEL

While steel mills strove to make up 126,000 tons of production lost to coal strikes, WPB's chairman, Donald Nelson, this week called on them for an extra 2,000,000 tons during the next six months. Launching the Steel for Victory drive, Nelson (right) and

his vice chairmen, Charles Wilson and H. G. Batcheller, made a tour of Pittsburgh steel mills. At nearby Homestead, Nelson inspected the big Carnegie-Illinois works with C.I.O.'s president, Philip Murray (left), who pledged steel labor's support. The WPB high command also met with labor-management groups.

furniture manufacturing firm of Mengel Bros. in Louisville, which is devoting a substantial proportion of its facilities to this work. Shipbuilder Andrew Jackson Higgins has contracted to build the Caravan under license at his New Orleans plant.

Fairchild has applied its Duramold process to the AT-21 advanced trainer (Yankee Doodle), a twin-engined, low-wing monoplane which is unusual in that its external surfaces are finished with waterproof paint rather than doped fabric. Ryan Aeronautical Corp. has achieved a close approach to the all-wood trainer in its PT-25, and Beech makes extensive use of plywood in its AT-10 transitional trainer. Other American manufacturers who make somewhat less extensive use of wood are Stearman in the A-75 and Timm in the PT-220-C.

• **Mosquito Stings**—Although the new era in wood construction came late to this country, England and Italy have never totally abandoned it. The accomplishments of the high-speed De Havilland Mosquito IV (DH98) are well known to the residents of Berlin. Power plant is the Packard-built Rolls Royce Merlin engine. Hamilton Standard propellers, built under license by De Havilland, are parts of the power plant.

Top of the Grade

Railroads have headaches
—here they are—but there is
no more talk of crises as war
load approaches its peak.

The Office of Defense Transportation and the railroads are heaving a sigh of relief—rail freight movement appears to be very close to the zenith, probably won't increase appreciably for the duration. Barring a bad crackup in equipment or an unexpectedly heavy loss of manpower, plans for general priorities on rail freight, complete elimination of crosshauls, and drastic zoning can be chucked into the ash can.

• **On a Plateau**—Latest Assn. of American Railroads estimates indicate that in the third quarter of 1943, total carloadings will be only 1.5% over the same quarter of 1942. In the quarter just passed, the gain over 1942 had been an estimated 2.5%. This slowup in percentages is no freak. Movement of war goods is now almost on a plateau. Further slight increases can be counterbalanced by the drop in civilian and semicivilian shipping.

On the other hand, while the rail-

roads have apparently made the grade without turning down a nickel's worth of general freight, they are still plagued by the problem of moving seasonal commodities and goods that require special-type cars. True to form, a fresh batch of headaches will arrive this fall.

• **Three Chief Headaches**—Headache No. 1 will be the movement of coal. The oil shortage has caused heavier coal shipments, and hence a shortage of cars is rapidly developing. Talk of zoning coal shipments is again rife (as it was last year). Under a zoning system, coal could be moved only on a regional basis, with the result that West Virginians would have to use West Virginia coal, Ohioans Ohio coal, etc. But it's a toss-up whether or not this plan will ever be put into effect; a big drawback is that it works severe hardships on the users of specialized heating equipment, notably in cities with stringent antismoke regulations. Rationing might be a more feasible plan, though oil rationing has proved to be OPA's worst chore. Whatever the upshot, however, the railroads can't haul much more coal unless some system for increasing ton-miles is adopted.

Headache No. 2 is going to be the shipment of grain. Cars of the type suitable for grain shipments aren't too plentiful, either, as witness the fact that a lot of Canadian grain destined for the U. S. is currently stored in Fort William, Ont., awaiting transportation (page 108). The likely result of the grain situation is that permits will be needed to move cereals into terminals.

Headache No. 3 is refrigerator cars. Rationing of canned goods has greatly enhanced consumer demand for fresh fruits and vegetables, but cars and men to ice them are lacking. In addition, refrigerator cars make an appreciable percentage of their runs as empties (there is little north-to-south or east-to-west demand for them). Priorities now loom as a very definite possibility, but even at that, don't be surprised if some perishables spoil.

• **Won't Count on Cars**—Enough new equipment to ease any of these situations is virtually out of the question. Some 25,000 additional cars have been authorized (of which a goodly percentage consists of open-tops), but this figure is not high enough to take the strain off existing cars, or to make up for the shortage of tank, coal, and flatcars. Rail steel is too tight for comfort, too. The current year's quota of 900 locomotives (of which all are freight or switch engines) is awfully liberal by general WPB standards, but there's some question as to whether they'll really be built and who is going to get them.

By and large, both WPB and ODT continue to work on the theory that the railroads have enough "give" to encompass any bulges in traffic. This viewpoint is the consequence of some mis-

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Somewhere Between A and ZYGO.

You don't picture the encyclopedia just by its covers. Neither do you regard it merely as a seemingly endless maze of articles on words beginning with "A" and ending with "ZYGO."

If you have struck a true acquaintance with the encyclopedia you have come to regard it as a dependable source of information with succinct descriptions for any word problem which may confront you.

In the fields of electronics and metallurgy, the Mallory business has something in common with the encyclopedia, furnishing answers to the problems that arise continuously in the rapid development of the newer techniques in industrial progress.

But while the encyclopedia of words is revised every few years, its counterpart in electronics development must be edited almost daily.

Mallory has pioneered for many years in the advancement of electronic control as a tool of industry. Experience gained by research and experiment has been applied to customer problems to develop a long list of products standard for electronics applications. Beginning with the fields of Radio and Communications, Mallory

has cooperated with industrial electronics development to the point where it has become common practice to consult Mallory engineers for a knowledge that, electronically speaking, is becoming encyclopedic.

Development of electronics applications has coincided with widespread metallurgical discoveries. Mallory metallurgists and engineers have originated many new alloys with highly specialized properties to answer new problems of control applications.

Consequently, the outbreak of war found Mallory in a position to enlist its services in highly specialized and critical war production. Constantly, Mallory engineers have been called on to meet changing specifications as military demands create new problems. The winning of the joint Army and Navy Award is one indication of how well Mallory men have applied experience and "know-how" to hitherto unanswered production questions.

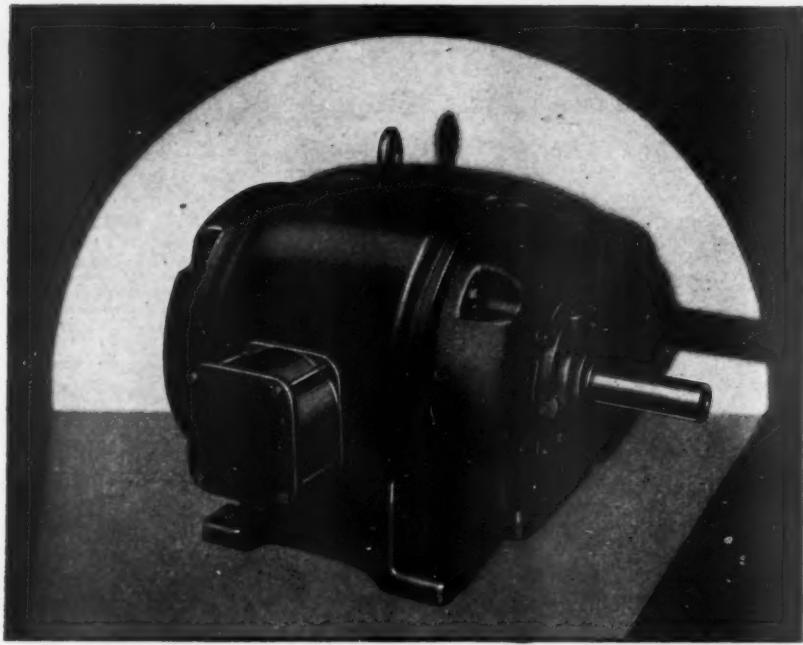
To its long list of standard products, Mallory is adding new ideas and new techniques that will be available for post-war use. When the peace is won, Mallory cooperation will play a role in speedy conversion of technical gains to industrial applications for the consumer's advantage.

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The precision-building skill and experience Wagner has gained in more than half a century of producing power-saving, man-hour-saving electric motors is reflected in the performance of these quality products. Their dependability makes them stand out as though they were always in the spotlight.

The same holds true for other Wagner products which include transformers, fans and hydraulic braking systems—all of which are being used in the fight for Victory.

If you need motors, or other products made by Wagner, consult the nearest of Wagner's 29 branch offices, located in principal cities and manned by trained field engineers.

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ELECTRICAL AND AUTOMOTIVE PRODUCTS

taken estimates in both 1941 and 1942—each of which was supposed to be the crisis in rail freight transportation. In a general sense, the crisis has come; between 1939 and 1942, miles jumped 90%, and the average haul per ton 30%, while the railroads kept chugging along with very little new equipment and practically no restrictions on the use of their facilities. As a result, WPB and ODT have had to worry very much over them.

• **How They Did It**—Be it said that the railroads themselves have been as surprised over their performance as the government. They figured they could haul perhaps 50% more than in 1939, but nobody even thought of a 90% jump. That the job has been done is largely the result of more efficient use of the vast physical resources of railroad manpower, and—for what it can read into it—the railroads' determination to erase the stigma of being a dying industry. Efficiency moves in one of the following types:

(1) Fuller loading of cars. By large, cars must be filled to weight limits, or maximum capacity, which is higher. Less-than-carload freight is total at least 10 tons per car, as against a 1941 average of about five tons.

(2) Priorities on highly specialized and scarce—equipment, used thus only in the instance of tank cars, in the offing for some other type as well.

(3) Faster unloading. Permissible loading time has been cut on reefer and open-top cars, and a reduction in the time limit on coal cars from 48 to 36 hours—is brewing. Elsewhere the time has not been cut by government order, unofficial cuts, or enforced by shippers' vigilante groups have been used widely.

(4) Better routing. Cars cannot be moved into shipping ports unless there is room for them. Similarly, permit systems have been used when special jams are in the way (as was the case last year in the shipment of grain to storage points). And the movement of empties—especially through the West Coast bottlenecks—has been eased by eliminating crosshauls and regulating fan-outs.

• **Manpower Strain**—Despite the short cuts, however, some freight has been jammed up. Thus, because of the high priorities for oil and chemicals on tank cars, asphalt shipments have suffered. Similarly, because of the shortage of open-tops, ore shipments are behind schedule. On the whole, though, the situations aren't protracted enough to cause any major jitters on the part of WPB and ODT.

The big worry currently is an intangible one: Will the manpower stand the strain? Trained railroaders, notably engineers, are older men who are beginning to show signs of fatigue. Secu-

3 IMPORTANT SERVICES for Burroughs users

INFORMATION SERVICE

There is an up-to-date reference library in each Burroughs office. It contains the latest detailed information on the application of machines to today's new accounting problems. This information, as well as the services of Burroughs' technical staff, is available to every Burroughs user.



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The manufacture of aircraft equipment for the Army Air Forces, and the manufacture of Burroughs figuring and accounting equipment for the Army, Navy, U. S. Government and the nation's many war activities, are the vital tasks assigned to Burroughs in the Victory Program.

CANTON STOKER

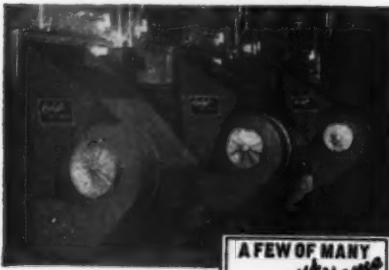
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SAVES
CRITICAL FUEL
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ADAPTATION TO NEW
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★ Planning conversion to coal stoker firing or expanding boiler room equipment? Then here's a tip—records in hundreds of vital war plants prove "CANTONS" offer low steam and maintenance costs, consistently deliver high overload capacities and meet 24 hour peak load demand. CANTON produces 54 stoker types and sizes—engineered for jobs up to 800 H.P. and more—designed for limited space applications and unusual conditions. Investigate CANTONS now for your permanent fuel burning needs.



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gangs, the fellows who keep the roadbed in shape, are slowly being depleted by labor migrations to other industries. Women are being used as replacements wherever possible, but there are distinct limits to female employment in railroading. Biggest blow of all would be such niggardly allotments of steel by WPB that the car-shop crews would become idle and seek employment elsewhere.

WPB will probably see to it that that doesn't happen (the railroads will be the beneficiary when the shipbuilding program gets over the hump). On the other hand, many a railroad will be lucky to come out of the war with something less than a rolling junkheap. But that's a problem nobody wants to tackle just now.

that was occasioned by the late start of the shipping season (BW—Apr. 24, p46).

Opening of the MacArthur gives the Soo four large locks for lifting and lowering vessels passing through the St. Mary's River bottleneck between Lake Superior and Lake Huron. The four are parallel in the canal which bypasses the three-quarter-mile rapids in the river. The other three have been handling a fair amount of traffic, but it has been necessary to limit the draft of the large carriers. The MacArthur will accommodate the biggest of them loaded to capacity.

• **Rush Job**—Construction was begun in March, 1942, by a force of more than 1,000 men and completed late last month. Work was given an extra push to get the MacArthur into service this season.

While structural details are the Army's secret, comparison of the MacArthur with its companion locks affords some idea of its size. Of the three locks now in use on the Soo—the Poe, the Davis and the Sabin—the Davis is the largest. It is 1,300 ft. long, longer by 350 ft. than the biggest lock in the Panama Canal, and 80 ft. wide. It is not unusual for the Davis to take five vessels through at a single lockage. The MacArthur is even bigger. It was designed to accommodate oceangoing vessels in the event that the St. Lawrence waterway is dug after the war.

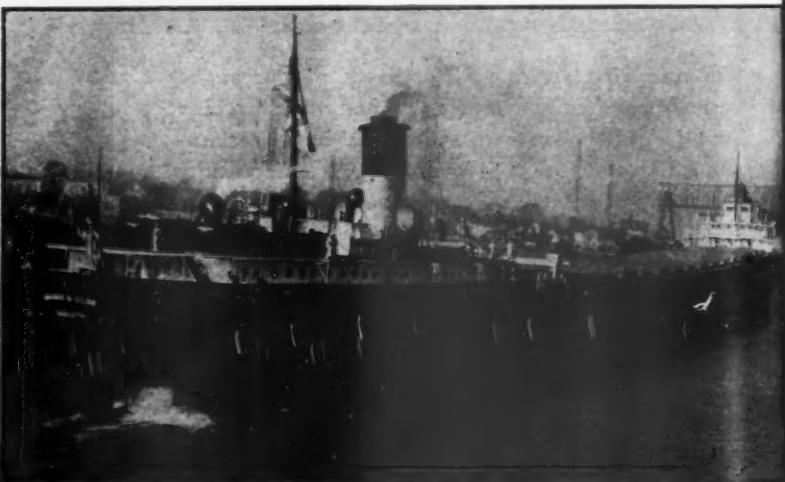
• **Primarily for Ore**—Importance of the Soo to the war effort is seen in the fact that 95% of the ore coming from the Lake Superior mines passes through the canal. In addition, a large percentage of the grain grown on farms in the Northwest and Canada moves through the Soo, as well as vast quantities of coal, autos, and other freight.

To Hasten Ore

MacArthur lock, ready for service, will increase flow of iron ore through the Soo Canal by 10,000 tons a day.

As Gen. Douglas MacArthur was unlimbering his great offensive in the Southwest Pacific last week, the lock bearing his name was put through its first tests for the job of channeling greater tonnages of iron ore through the canal at Sault Ste. Marie.

• **Make Up Lost Tonnage**—Ore shippers are depending on the MacArthur lock—in conjunction with the higher water level prevailing on the Great Lakes—to increase the capacity of the Soo Canal by some 10,000 tons a day and thereby make up in part for the loss of tonnage



Among the big ore carriers welcoming the comfortable clearance in the new MacArthur lock at the Sault Ste. Marie are the five new ships of U. S. Steel's fleet. One of them, the Irving S. Olds (above), broke the Great Lakes tonnage record for a single ship haul by toting 18,161 tons (439 less than its rated maximum), but scraped bottom in the old locks in doing it.

REA Head Loses

Slattery stripped of power in feud with electric co-op over scheme to raise money to back up huge insurance plan.

Administrator Harry Slattery of the Rural Electrification Administration has been shorn of his authority in a battle with Clyde Ellis, executive manager of the National Rural Electric Cooperative Assn. Slattery, a White House appointee and long-time crusader for many New Deal policies, didn't get fired, and he may not resign. Instead, the ancient Roosevelt stratagem of slipping in an intervening layer of authority was employed.

• Report through Neal—Henceforth, by order of Secretary of Agriculture Claude Wickard, all REA section and division heads and administrative employees will report to Slattery only through Deputy Administrator William J. Neal, New Hampshire stockman and co-op president whose recent appointment the electric co-op hails as "most acceptable."

The co-op seems to have dropped its plan to take over the insurance business of 800 REA co-ops. It founded two mutual companies some months ago and, for financing, set out to raise \$1,000,000 in loans from the membership and from operational funds of the co-ops, the notes to be unsecured and pay 3% interest. It was Slattery's opposition to the plan which launched N.R.E.C.A. into a violent campaign to secure his ousting.

N.R.E.C.A.'s insurance sales efforts have lagged noticeably for some weeks, and it reportedly has advised several co-ops whose insurance is soon to run out to renew existing policies with commercial casualty companies. Some of the informed guessing in Washington is that N.R.E.C.A. bowed to the inevitability of government disapproval of co-op loans to N.R.E.C.A. insurance companies and, in return for its compliance, got Slattery's scalp.

• Government Can Crack Down—First step in the withdrawal of co-op funds as a source of N.R.E.C.A. insurance capital came this week in an opinion by Robert H. Shields, solicitor of the Dept. of Agriculture, requested months ago by Slattery. While not absolutely forbidding co-op loans to the N.R.E.C.A. companies, Shields' opinion makes it clear that the government can crack down on all but a few of those which may wish to advance funds.

The basis for the crackdown is the fact that such a loan radically alters a co-op's financial position, and the financial stability of the co-ops is the only guarantee the government has of getting its money back. The opinion points out



Graybar has mobilized specialized electrical supply services!

Graybar service to industry on electrical supplies keeps step with the nation's most critical needs.

In the period of war-plant construction, GRAYBAR established a remarkable record for supplying lighting, signaling and wiring materials to get these plants up and into service faster.

Now, that ships and planes are America's No. 1 concern, GRAYBAR is helping to speed up the distribution of the thousands of electrical parts which enter into their construction. Mass production calls for big-scale distribution, and GRAYBAR has mobilized to meet it with separate Marine and Aircraft Construction Departments.

In aircraft and marine centers, specially-trained GRAYBAR Representatives are ready with facts and figures on a long list of electrical products, approved by Army, Navy and other regulatory bodies.

Serving as your *Procurement Advisor*, GRAYBAR is prepared to seek out and supply the part or product you want, whether it is of standard or special design. Products that "go together" in service come together from a single local source. You save paper-work and purchasing time, from drawing-up the "specs" right through to the billing.



*Air-conditioning
with GAS*

Until Pearl Harbor nearly everyone thought of air-conditioning in terms of a cool, comfortable restaurant, theater, store, office, building or train. Today air-conditioning is both a production tool and a front-line fighter.

Take, for example, one of our high-altitude bombers:

The instruments on which the pilot checks his altitude and other flight conditions are manufactured and assembled in a dust-free atmosphere protective against corrosion and tarnish.

The closely-guarded bombsight is assembled in a controlled atmosphere. The lenses through which the observer sights his objective are precision-ground at a constant humidity and temperature. The picture which he takes of his objective will be developed in an air-conditioned laboratory.

Further, the black powder which is part of every type of bomb, has been conditioned; even the bullet-proof glass and the silk of his parachute could not have been produced without air-conditioning.

And, usually, that means Gas . . . for most types of industrial heating and heating . . . because Gas has speed, efficiency and accurate controllability. Drying and air-conditioning happens to be just one of the many fine jobs Gas is doing in this war.

If your plant has a heat processing problem, call your Gas company for help.

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that only a few of the co-ops are in such condition that they can make loans as high as \$8,000 on unsecured notes and not reduce their financial position to a level at which the government could step in and call a halt.

• **Wickard's Approval Doubted**—Agriculture Dept. insiders expect that Wickard will rule on the issue sooner or later, although he may not have to if N.R.E.C.A. has really dropped its insurance business until it can arrange other financing. They point out that while Shields' opinion is not conclusive, Wickard can hardly indorse a private insurance company, particularly while several American Farm Bureau Federation mutuals hold appreciable slices of the business now.

N.R.E.C.A. reportedly was set to organize local co-ops into purchasing groups and, armed with mass purchasing power, take their orders for electrical appliances. Through this device, the co-op expected to build up a nation-wide group which could control several senatorial and numerous congressional offices, according to the published story of Judson King, a high REA official. This idea went by the boards when the War Production Board halted the manufacture of electric appliances. Another scheme, that for a national magazine with a monthly circulation of 1,000,000, was stopped by the wartime shortage of paper.

Great Evacuation

Army's cancellation of leases leaves hotels with big problem: finding materials and men to recondition properties.

The lush days of Army occupation are about over, and owners of some of the 434 hotels leased by the Air Forces are beginning to show concern about the future of their properties. Starting next week, the great evacuation will get under way; and by Aug. 15, some 206 hotels, apartment houses, and other structures will have been vacated by Army trainees.

• **Reconditioning Problem**—What worries the hotel owners most is the reconditioning of their properties in time to capture what is left of the resort trade. This is true particularly of the owners of the 109 Miami Beach houses and 35 Atlantic City buildings about to be evacuated. There is little disposition in the War Production Board to help them, by priorities, in rounding up new furnishings to replace any which may have been damaged or destroyed while their properties were under lease to the Army. The necessity of converting back to single bathrooms, installing telephones, and redecorating, with manpower and mate-

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1943



"SCRATCH 6 NIP SHIPS!"

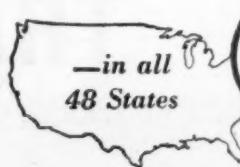
**Six menacing Jap ships sunk in 27 minutes!
Six more notches in our Navy's belt of steel.
A battle score pointed to with pride by mem-
bers of the heroic crew.**

**There was a time when this fighting ship
of our great Navy was a million or so separate
pieces and parts. Thousands of workmen in
hundreds of scattered plants produced the**

steel, the myriad parts to be assembled in
hundreds of other plants and on the ways.

No matter where these plants are located
one of Texaco's more than 2300 wholesale
supply points is nearby. A Texaco Lubri-
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selecting the most suitable Texaco lubri-
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DEHYDRATION—the process of extracting water from foods of all descriptions by heating and drying—is waving a magic wand. Where once a bushel of potatoes occupied cubic feet of valuable shipping space, the dehydrated product occupies cubic *inches*. Those precious savings when pyramided mean ships and more ships. Now when a 10,000 ton ship comes sliding down the ways, the equivalent of two and even three ships is really being launched.

In many dehydration systems, Trane equipment is used to provide the heat which, in turn, liberates the unwanted water from vegetables, fruit, eggs, meat and other edibles.

This is another way in which Trane Air Engineers on every industrial front are sending Trane equipment to war against the Axis. They are enlisting heat, cold, air movement, in fact the very weather itself to assist the men of our fighting forces and our allies.

And when Trane Air Engineers are mustered out of service the developments they are making today will mean the improvement of health, comfort, and better living in a better tomorrow.



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AIR[®]

THE TRANE COMPANY • LA CROSSE, WISCONSIN
TRANE COMPANY OF CANADA, LTD., TORONTO
AIR CONDITIONING • HEAT TRANSFER • AIR HANDLING EQUIPMENT

rials at a premium, only compounds their dilemma.

Whatever nightmares these problems have created, Atlantic City hotel men are maintaining a breezy front. Two already have announced plans for reopening to civilian patrons—the Shelburne and the Carolina Crest—and others are struggling to get back into the swim. The Chamber of Commerce was on the job the day the Army revealed its evacuation plans with an announcement that civilians predominated among incoming railroad passengers for the first time since last August. Plans for a lively advertising campaign are under way. But Atlantic City wants two strings to its bow. Hotel men also are urging the government to station some of its bureaus and agencies in Atlantic City to cushion the financial shock of the Army's departure.

• **Rich Harvest**—With a peak registration of 40,000 officers and men earning an average of more than \$60 a month, the hotels were not the only business houses to enjoy a windfall. Confectionery, cigar, gift, and jewelry stores reaped a rich harvest, and their owners agreed with restaurateurs and concessionaires that it was the best winter in history. There were 52 shops devoted partially or exclusively to sale of military equipment.

Cancellation of the 35 hotel leases will not leave Atlantic City without mil-



MAYFLOWER WITH GUNS

Welders and armorers are completing the job of refitting the Presidential yacht, Mayflower, into a Coast Guard patrol and convoy vessel at Norfolk, Va. Soon it will go to sea on a shake-down cruise before assignment to duty as the U.S.S. Butte. The yacht's luxurious furnishings and deck frills have been replaced with heavy gun mounts and depth charge racks.

"But this is only half of it,"

says the Navy

ORDINARILY, a landlubber thinks of a battle at sea in terms of crashing shells and bursting bombs.

"But this is only half of it," says the Navy. "Experience has shown that the fires caused by enemy hits are often a greater danger than enemy shells. They can take a ship out of action while her fire power is still effective."

Of course, the Navy has the last word in fire-fighting equipment . . . water curtains, fog sprays, chemical apparatus, and carefully decentralized pumping equipment.

More Fire-Prevention

But the Navy's fire-fighting goes even further than this. They have banished certain types of paint and floor covering, crews' extra clothing, even hair tonic, from shipboard.

They burn too easily.

Less colorful but equally important is what the Navy has done about the insulation which every ship must have on bulkheads, around the crew's quarters, in food storage spaces, on more than 50 other places in all.

They decided that this insulation, which could be a dangerous fire hazard, must be *fireproof*.

So, the Navy selected a glass insulation. Strangely enough, the glass in this insulation is not glass as we meet it ashore in windows or on the dining room table. But glass in a new and different form . . . in the form of fibers.



You can bend these fibers. Twist them. Weave them into textiles. Form them into wool. They are springy. *Light in weight*. Unharmed by salt water. Do not absorb moisture. They are *highly fire-resistant*.

Better War Weapons

This new insulation is a form of Fiberglas*—a basic material developed and proved in many uses only a few years before the present war began. Being the makers of Fiberglas, we are mighty proud of the part it's playing in the Navy's fire-fighting program.

This is only one instance out of many where

alert and determined Navy personnel has been quick to seek out and use the most advanced of materials—to make our war weapons better than our foes'.

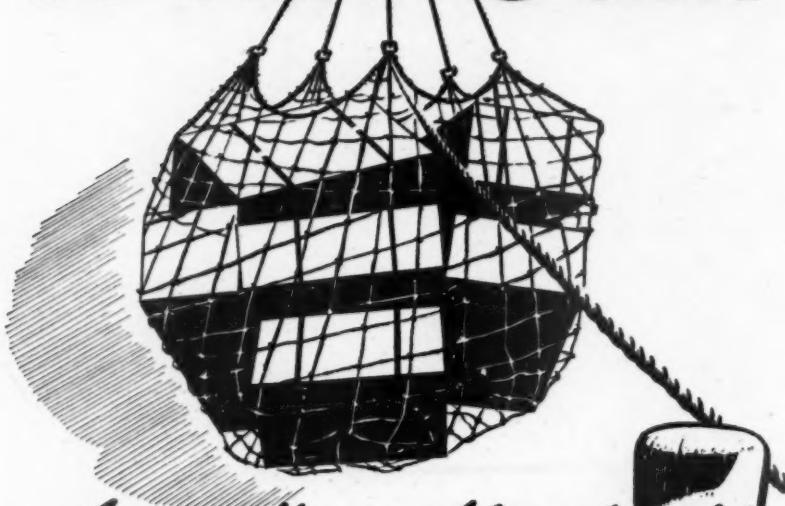
For this reason, everyone of us at Fiberglas is helping 24-hour production to supply adequate amounts of our material to our armed services. *Owens-Corning Fiberglas Corporation, Toledo, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.*



FIBERGLAS

® U. S. Reg. U. S. Pat. Off.

A Net Gain



...because it was shipped right

AND STRAPPED RIGHT

Over the side it comes . . . into the waiting hands of Allied fighting men. This shipment was a net gain for the Allies . . . because proper packing and reinforcement assured its arrival in perfect condition. Bound with Acme Steelstrap,

shipments are reaching the United Nations safely all over the world. Providing maximum protection against damage, Acme Steelstrap complies with all Federal Strapping Specifications . . . is made in all types and sizes.

ACME STEELSTRAP Eliminates

The shipment that reaches destination in perfect condition can help to bring down a Jap Zero—but the effect of a damaged shipment is only a zero. Remember, that a product becomes a war product only when it reaches the hands of those who use it . . . in perfect condition.

And safe delivery is only one advantage of Acme Steelstrap. This modern, reinforcing process saves important time in loading and unloading . . . conserves container material . . . and saves loading space. It is used for all types of war products packed in boxes, crates, bundles or on skids . . . and for carload ladings, Acme Unit-Load Bands are employed. Get full information today. Write for free helpful literature.

Damage — Makes Shipments Count



Keeping the production lines moving while the boys are away—is the aim of many women in industry today. The ease and convenience of Acme Steelstrappers are aiding many women to keep the packing rooms in step with production.

FOR EVERY TYPE OF SHIPPING PACK



ACME STEEL COMPANY

2828 Archer Ave., Chicago, Illinois

tary guests. Some 16,000 soldiers main in the twelve hotels still leased by the Army Air Forces; there are more a nearby airport; and the Coast Guard operates a radio school and beach and offshore patrol stations there.

• **Wear and Tear**—The hotel men are interpreting literally the clause in the Army leases requiring payment for damage beyond reasonable wear and tear. They complain that wear during the year of Army occupancy has been equivalent to from 10 to 15 years of normal civilian use. Representatives of 26 hotels are planning concerted action for extra compensation.

In addition to the Atlantic City and Miami Beach hotels, the Army is turning back all its leased properties at St. Petersburg and Boca Raton, Fla., Chicago (the Congress and the Coliseum) and Grand Rapids, Mich., thereby realizing an annual saving of \$4,600,000 in rentals. With few exceptions, leases were subject to cancellation on 30 day notice.

• **Back on the Block**—One structure the Army will not turn back is the \$26,000,000 Stevens Hotel in Chicago (BW—Jan. 2 '43, p 18), bought outright for \$6,000,000 to house 9,000 soldiers undergoing technical training. But the Army is seeking a buyer for the white elephant and can promise availability by Aug. 1.

Finding a buyer is complicated by the fact that the Army auctioned all the furnishings of the Stevens last Mar. 1. Any prospective purchaser will have to figure out how to furnish the place. Reports that the Army will arrange for priorities on furnishings have stirred an enthusiastic response from WPB. The Service Equipment Division of WPB is opposed to it.

Laundries Beset

Say WMC's relief measure offers no real help for their troubles; think that "textile maintenance" is essential job.

Beleaguered laundry owners are waiting that the latest attempt of the War Manpower Commission to solve the troubles gives them nothing that they didn't have already and that what they had was a long way from enough.

In authorizing regional directors to classify laundries as "locally needed," WMC aims at establishing uniform national policies for carrying out a practice that is already common. Laundries have a semi-essential status in 14 entire states and in 17 areas in other states. This gives them immunity to labor-pirating and the help of the U. S. Employment Service in recruiting workers.

• **What It Means**—The principal change arising from the new instructions is

BUY UNITED STATES WAR BONDS AND STAMPS *

PETER MÜLLER-MUNK
Industrial Designer



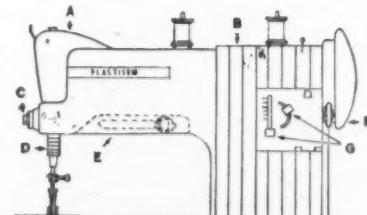
Why are men interested in this sewing machine?

Do you ever think about the vast industrial success that has been enjoyed by the manufacturers of sewing machines? What will be the position of their market in the post-war era?

Pursuing this thought, Mr. Müller-Munk has re-engineered the sewing machine in the above design for the future . . . incorporating both functional improvements and greater sales-appeal through the use of Durez plastics. As he says . . .

"Even before I ever put pencil to paper, I could visualize what scope Durez plastics would give me in re-designing the conventional machine. First of all, their molding versatility permits the use of complex shapes and sections without adding to production costs. Second, plastics give desirable lightness in weight to the finished product. Third, they have high impact strength, durability, high dielectric resistance. And eye-appeal, of course, in their lustrous finish and handsome colors—a sales advantage exploited in the contrasting-colored housings above."

Here is still another example of how Durez plastics will have a leading position in the re-shaping of America's post-war products. Today, they belong to the men at the war fronts. Tomorrow, they will give physical expression to the way of life we fought for.



FEATURES OF MR. MÜLLER-MUNK'S DESIGN

- A End Plate, molded separately of Durez to facilitate assembly
- B Molded Durez Motor Housing
- C Tension Regulator—shifted to center of End Plate
- D Molded Durez Bearing Housing—bearings housed separately to reduce bulk of main molding . . . to provide better visibility
- E Light concealed in main molding will always be in correct position for proper illumination of work
- F Molded Durez Shaft Disengaging Wheel
- G Molded Durez Lever Knobs—re-designed for better grips; better visibility and accuracy in making stitch selection

DUREZ PLASTICS & CHEMICALS, INC.
547 WALCK ROAD, NORTH TONAWANDA, N.Y.

DUREZ

PLASTICS THAT FIT THE JOB

WMC regional directors is that laundries seeking this form of relief will now be required to meet service standards set up by WMC with the help of the Office of Civilian Requirements. The standards boil down to elimination of all fancy frills—full-finished services, shirtboards and tissue paper, frequent deliveries. Commercial laundries and linen supply houses will be expected to put the bite on hotels and restaurants to cut down on use of linens.

The American Institute of Laundering declares that most of its members already have curtailed service at least this drastically (BW—Jun. 12 '43, p38). Ordinarily, of course, it's the fancy services that bring in the profits, and the laundries shudder to contemplate the effect on postwar trade if the housewife finds she can do up her husband's shirts the same as grandma used to. But right now the object is to get the wash back to as many customers as possible, as fast as possible, and never mind the trimmings.

• **What They Wanted**—Laundry owners doubt emphatically that they can squeak through unless somebody gives them a lot more help than they're getting now. What they want was summarized recently in a petition to WMC by the industry's three big trade associations—the American Institute of Laundering, the Linen Supply Assn. of America, and the National Assn. of Dyers & Cleaners. The petition asked that laundries be given the status of an essential industry—by extending the essential rating of textile production to include textile maintenance—and that certain occupations (plant superintendent, stationary engineer, wash man, plant and automotive maintenance) be classed as critical, which would make them eligible for draft deferment.

WMC's immediate answer to this was that it would take all steps necessary to prevent a complete breakdown of laundry service. Specifically, the agency said it would support conservation of manpower within the industry, help in the recruitment of part-time and physically handicapped workers. This the laundries look upon as considerably less than half a loaf.

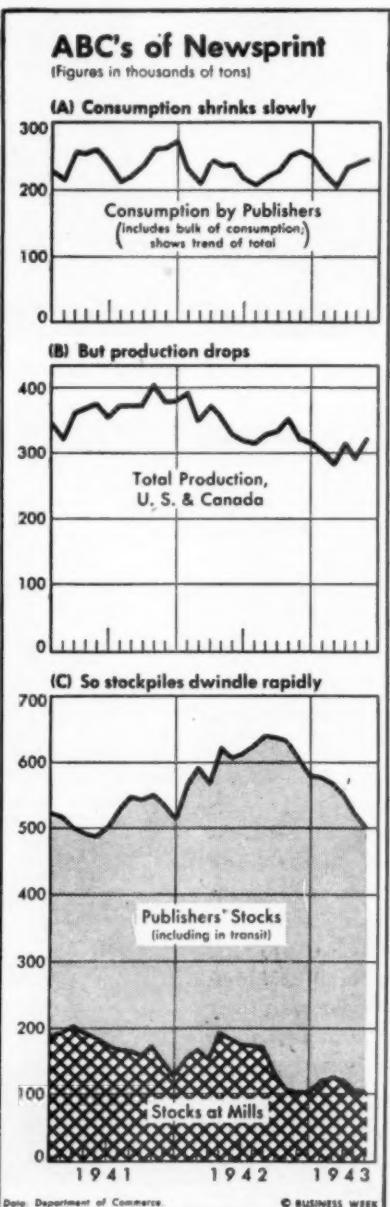
• **Caught between Agencies**—Laundries complain that they're caught in the old agency-to-agency ball-tossing game. Referral of workers by USES does no good, they say, when it simply means that women who go in to apply for a 40¢-an-hour folding job in a laundry find that they can qualify for work in a war plant at double that. It won't help laundries much to get WMC aid in recruiting workers if they can't get permission from the National War Labor Board to pay the workers higher wages, and they can't afford to pay them higher wages unless the Office of Price Administration allows them to starch prices.

Wood Pulp Pinch

WPB takes full control of supplies, and Canada puts quotas on newsprint deliveries. Plans on allocations closely guarded.

Increasing severity of the wood pulp shortage, largely caused by the manpower troubles that impelled Canada to order a 13% cut on July newsprint deliveries to the U. S., has resulted in WPB's assuming allocation control over all grades of wood pulp. Amended order M-93 will insure pulp for essential paper and paper products and for essential chemical and textile uses.

• **Supplies Eaten Into**—Wood pulp receipts have been averaging 26% less



than in 1942, and inventories have been falling at an average rate of 34,000 tons a month. WPB says the industry faces "a critical situation," and informed pulp men would rather not think what would happen if the drain on supplies isn't stopped.

Beside allocating pulp, probably a basis of end uses, WPB is urging increased use of waste paper, secondary fibers, and ground wood whenever these can be substituted for other grades. Patriotic campaigns among woodsmen will be pushed to stimulate production and an effort will be made to solve the relatively high wage problem in the southern woods that has caused some cutters to take more holidays than less prosperous days.

• **Previous Controls**—Until May, WPB controlled only delivery and acceptance of pulp by consumers. On May 4, the Pulp & Paper Division required the withholding by producers of 20% of output, beginning with June. This was to be delivered only with WPB approval.

Canada, which supplies about 75% of U. S. newsprint needs, has been shipping the 210,000 tons a month promised. To conform to this supply, WPB sought a formula earlier this year which would curtail consumption. This called for a 10% reduction from 1942 use. Actually magazine publishers took the full cut while newspapers got by with only 5% reductions. The failure of the formula has prompted the new action, and further paper cuts affecting publications, commercial printing, and containers now seem certain. WPB has been unusually secretive about plans for allocations and forbade its paper and pulp experts to talk on threat of dismissal.

• **Meaning of the Order**—Canadian newsprint mills are glad to be relieved of responsibility for apportioning available supplies among U. S. customers. The 13% cut, ordered by Canadian newsprint administrator, Guy Houle, after consultation with WPB, was mistakenly understood at first to impose a further slash in Canadian production. Actually it is intended merely to sustain the 210,000-ton rate of delivery in the face of orders for 240,000 tons.

The decree applies to July deliveries only. Shipments for the balance of the third quarter will be governed by the new distribution plan to be worked out by WPB by July 15.

• **Small Orders Fare Best**—U. S. publishers securing requirements from Canada in less than average quantities will have a slight edge on those who have placed large orders, since the application of the 13% will be averaged out to conform to carloading requirements; presumably big buyers will be by the carload, while small buyers will gain because of the impossibility of splitting rolls.

Cans Butt-Welded

American Can testing process, which eliminates overlap in side seams, may save the industry millions a year.

A new method of butt-welding side cans on tin cans which may save the industry many millions a year is now being tested for possible future adoption by the American Can Co. The process is the result of twelve years of development by I. M. Diller, a Brooklyn consulting engineer associated with M. Demarest & Associates as technical adviser.

Eliminates Overlap—Savings would be tinplate and solder. Butt-welding would eliminate the overlap of the metal at the seam and would also eliminate the solder. The edges of the sheet are fused to each other so that no additional material is required. The seam is ductile and of the same temper as the body of the can. The seam would not be noticeable, the cylinder of the can in effect being fabricated into one continuous piece of metal. Since the present can has two to four plies of metal in the side seam and the butt-welded can has only one, possible leakage at the point where the seam meets the end covers promises to be minimized.

American Can Co. says the process is under investigation by a group of its technical men who are working independently at separate locations in various parts of the country. The company believes the invention holds promise, although it is not yet ready for adoption. American Can has acquired manufacturing rights for the United States and Canada. Savings can hardly be figured in advance, a spokesman says, because for one thing it has not yet been determined how much additional power will be acquired.

Long-Sought Process—Steel of the thin gage (0.011 of an inch) used in tinplate for cans has never been butt-welded, although the industry has sought such a process for a quarter of a century. The time required for Diller's butt weld is substantially less (0.006 sec.) than the 0.030 sec. which could be allowed for the weld between mechanical movements on a fast-moving production line turning out 425 cans a minute. Can manufacturing methods now in use put them through about ten feet of solder bath in the course of their production line trip. However, butt welding would not materially speed up the production rate, despite the elimination of solder, because of the mechanical limits of handling such light steel. Diller does not expect a maximum of more than 500 cans a minute.

It has been possible to lap-weld thin-

100% For Victory . . . Copper

Production of fabricated brass and copper needed for so many vital war uses is one of U. S. Industry's most important objectives

Salvage: Man and Materiel

Riddled by enemy gunfire, the wing of an American bomber collapses. The crew bail out . . . as the proud ship crashes in a tangled mass of wreckage.

Then begins a two-way salvage job. The injured members of the crew are rushed to a base hospital, where the



TOTAL WASHOUT?

world's finest surgeons and medical equipment are waiting to restore them to health.

Likewise, skilled mechanics go to work on the wrecked plane. Usable parts are removed to a replacement stockpile. Parts damaged beyond repair, including those made of copper or brass, are salvaged and sent back to the nearest processing point. Hundreds of pounds of copper and brass from a washed-out fighter will "live" to fight again.

New metal. A tremendous amount of virgin copper direct from refineries, largely those of Anaconda, is being converted into various alloys for war use by the 13 U.S.A. and Canadian plants operated by The American Brass Company. Annual output since 1939, a busy year, has trebled.

Machining Manual

Conversion to war production brought many a problem to factory superintendents and artisans unaccustomed to machining bronze, nickel silver, and other special copper alloys. Although most of these metals are easily worked, cutting tools and feeds had to be adjusted to obtain maximum output.

Hence the reception accorded the first comprehensive manual on the subject, recently published by The American Brass Company. Primary purpose of the book: to help save time and metal, to help produce finer finishes

and closer tolerances, to help to get top production from existing machine shop equipment. From eager metal workers, requests to date have established a surprisingly large circulation for a manual of this kind.

Nuisance Eliminator

Victory or defeat may depend on the efficient operation of radio apparatus carried by planes, tanks and other motorized equipment on the battle front.

To this end, sheet copper is being used to completely line the walls, floors and ceilings of radio suppression laboratories which are used for the careful tests given such radio equipment. The copper lining provides an electro-



RADIO AT WAR

static shield which prevents inside and outside static interference with the testing procedures.

We'll Keep 'em Flying

Employees cheered as a bit of red and blue bunting unfurled on June 16, above two Kenosha, Wis. plants—one a long-time branch of The American Brass Company, the other a plant operated by the company for the U. S. Government.

This award of the Army-Navy "E" pennant carried more than local significance. It was the last of a series of similar awards for excellence in production—on that date *every one* of the ten U.S.A. plants operated by the company was flying the cherished flag.

Employees have this added incentive for all-out effort: 1943 output of the company is ear-marked 100% for war production, and over 4400 former fellow employees are serving in the armed forces.

BUY A WAR BOND TODAY

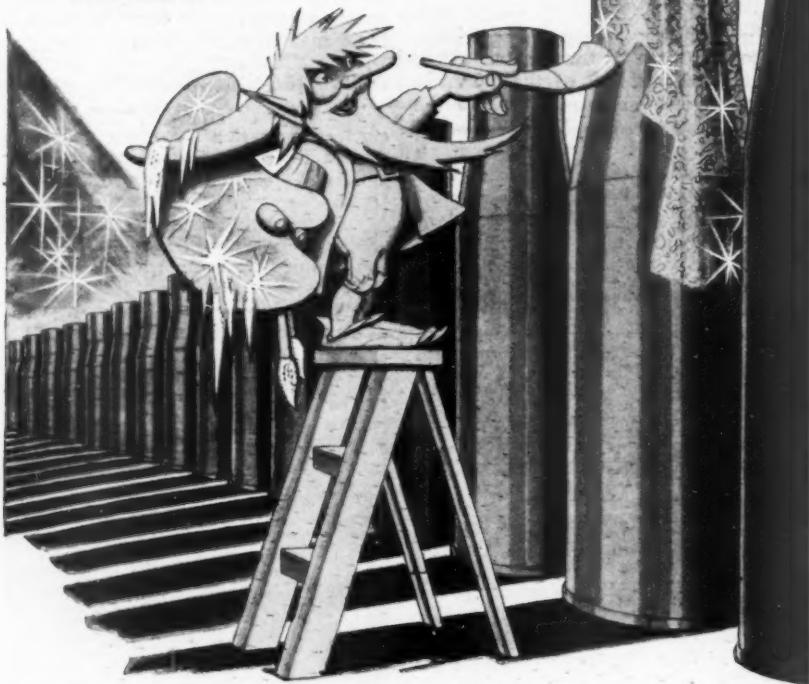
Published in the interest of a better informed war effort by
THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Connecticut

Subsidiary of Anaconda Copper Mining Company



Air at Work...
gets the right "Jack Frost"
pictures in shell cases
- Fast!



Large crystals appear on your window pane in winter when frost forms slowly—small ones when Jack Frost paints with a hurried brush. The same thing happens to the grains *inside* the metal when steel is cooled—and the large crystals, formed from slower cooling, make the steel less brittle, more workable . . .

Unimportant? Not when brass is hard to get, and fast production of steel shell cases hangs in the balance! When American Industry made the shift from brass to steel, the cooling of 1300° hot steel shell case blanks down to 560° was a real problem. The poisonous and explosive fumes which high temperature water quenching of steel causes could have been controlled. But brittleness, resulting from over-fast water quenching, would have precluded subsequent cupping and drawing.

What to do? Could steel be cooled in *air*, *fast enough* to keep up with the capacity of annealing furnaces, and the hands that waited to pass this ammunition? Sturtevant Engineers went to work . . .

Now, precision blasts of air from special Sturtevant Fans take the excess heat from the blanks and cups. More than *two tons* of air cool every ton of steel—with no change in the steel's char-

acteristics—to a point where water quenching is practical...and shell case production goes up . . . up . . . up!

HOW MUCH AIR TO BANISH YOUR POST-WAR PRODUCTS' BOTTLENECK?

Yesterday, this and hundreds of other ways of "putting air to work" were Sturtevant Engineers' dreams. Today, they are production realities that fight for Victory. Tomorrow, their wartime purpose will be turned to the making of better, more abundant peacetime products. Any process, present or future, where **AIR IS ENGINEERED**—to ventilate, to heat, to convey, to control dust and fumes or burn fuel *more efficiently*—will have a decided jump on competition.

B. F. STURTEVANT COMPANY
 Hyde Park Boston, Mass.

Sturtevant
Puts Air to Work

gage metal. However, such lap welds require extra steel for the lap and have not yet been accomplished at a rate of speed sufficient to allow for the time required for the mechanical movement. In any event, such seams tend to break upon the heavy flanging and double seaming which is necessary for putting on the covers.

In Diller's butt-welding technique, the ductility of the weld is a "natural" feature of the process."

Turn off the Light

That's the theme of plan sponsored by utilities to save juice—and fuel—with formal brownout program.

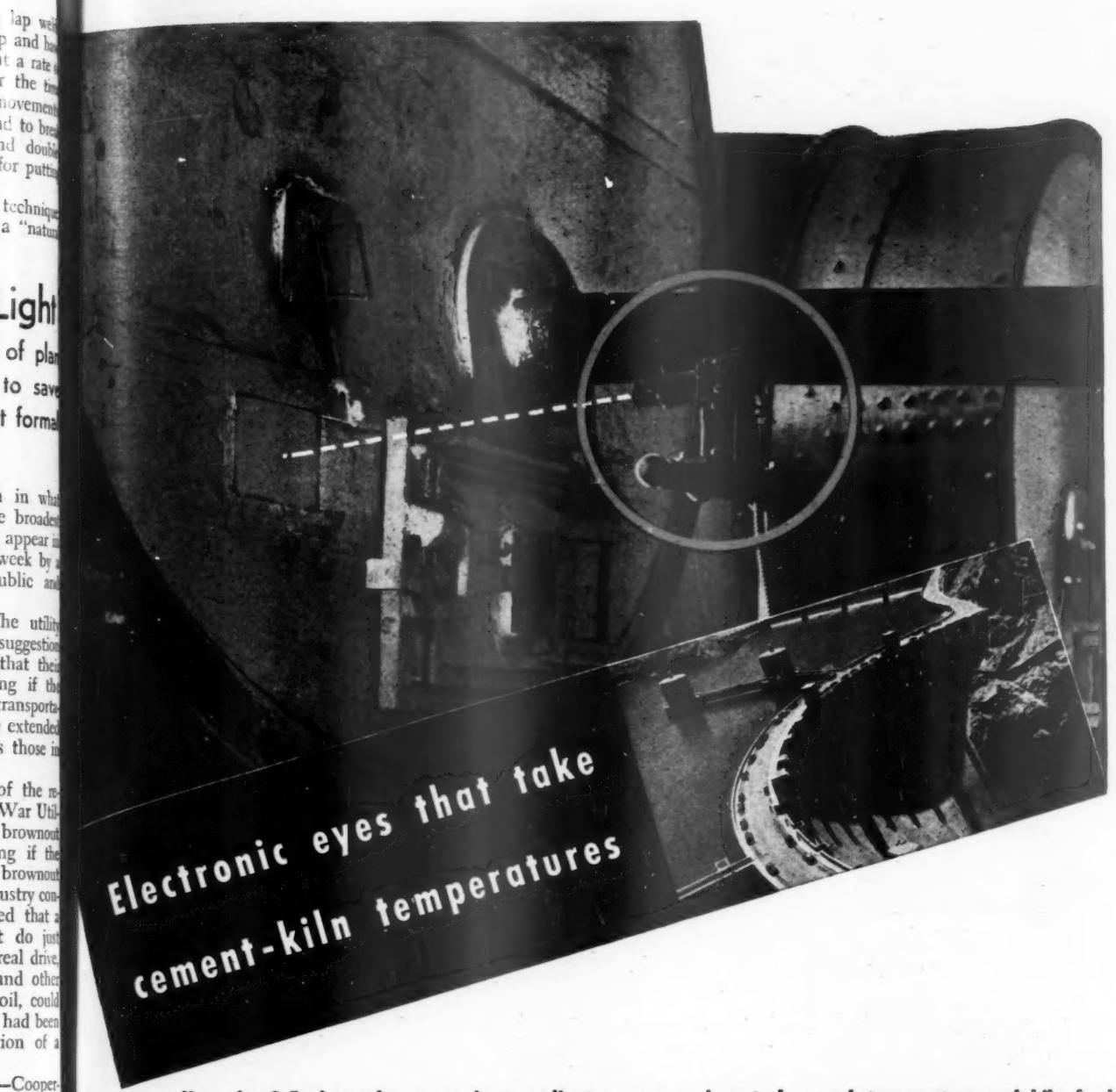
The first specific program in what WPB hopes will become the broader conservation campaign yet to appear in this war was drawn up last week by a dozen representatives of public and private power producers.

• **Utility Men's Demand**—The utility men were there at their own suggestion—but with a determination that their industry would only go along if the projected savings of coal, oil, transportation, and manpower are to be extended to other wasteful uses besides those in the electric utility industry.

The campaign stems out of the reluctance of WPB's Office of War Utilities to institute a mandatory brownout of commercial display lighting if the savings possible under the brownout could be made otherwise. Industry conferees on the brownout agreed that a conservation campaign might do just that, and pointed out that a real drive, aimed alike at the railroads and other industries using coal, gas, or oil, could totally eclipse the savings that had been anticipated with the institution of a brownout.

• **Want Byrnes' Sponsorship**—Cooperating in the campaign with the Office of War Utilities is Interior Secretary Harold Ickes, who enters the picture as Petroleum and Solid Fuels Administrator for War, the Office of Defense Transportation, and several other agencies. The utility men are more than anxious to have WPB Boss Donald Nelson take the broad plan to War Mobilization Director James F. Byrnes for indorsement and the government sponsorship which would lend weight to their advertisements in home-town newspapers urging customers to turn off their lights, cut down the temperature in coal-heated homes, and otherwise help peel the disposable fat off civilian living standards.

Wasteful burning of lights, both at home and in advertising signs, will have to go, although just how this dictum is



How the G-E phototube responds to radiant energy, and controls speed, temperature and kiln feed



You are looking at one of the most dramatic uses of the "electronic eye"—a phototube pyrometer that automatically controls a kiln in one of the nation's leading cement plants.

This electronic eye is focused on a clinker cascade of red-hot cement within the kiln. Radiant energy given off by the clinker as it changes temperature acts on the tube, and causes a corresponding change in the current it passes.

Other electronic tubes receive this change in current; the temperature of

the clinker is adjusted by speeding up or slowing down the kiln; and at the same time, a permanent record is made of temperature and kiln speed. A better cement for dams, tunnels and bridges is the result.

There are literally hundreds of applications of the G-E phototube in industry today. One phototube counts the valves speeding down a war production line. Another rejects imperfect ball bearings by automatically sizing each one to perfect dimensions. Still others perform a thousand tasks that hasten the war effort.

General Electric engineers will aid any manufacturer of electronic devices

in the application of tubes. Through nation-wide distribution, General Electric is prepared to supply users of electronic devices with replacement tubes.

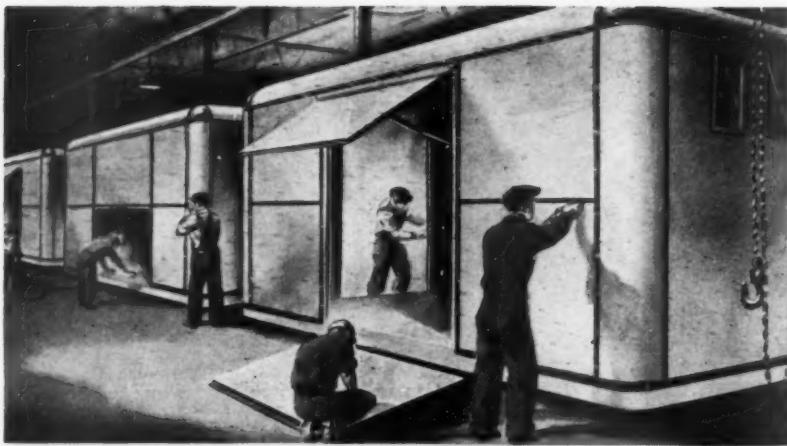
FREE BOOKLET ON ELECTRONIC TUBES
We will keep interested men in your plant informed of electronic developments. Ask us to mail without charge the book, "How Electronic Tubes Work," written in easy and understandable language. Address Electronics Department, General Electric, Schenectady, New York.

• Tune in General Electric's "The World Today" and hear the news from the men who see it happen, every evening except Sunday at 6:55 E. W. T. over CBS network. On Sunday evening listen to "The Hour of Charm" at 10 E. W. T. over NBC. Buy War Bonds today for the better things of tomorrow—including a General Electric FM radio-phonograph.

GENERAL ELECTRIC

155-810-2850

PUTTING ELECTRONIC TUBES TO WORK FOR AMERICAN INDUSTRY



—They're building Extra Combat Bodies with the same amount of material because

LINDSAY STRUCTURE S-T-R-E-T-C-H-E-S STEEL

LINDSAY STRUCTURE
STRETCHES STEEL
for Domestic Use



The use of Lindsay Structure makes it possible to build more trucks and trailers, too.

Lindsay Structure light-weight trucks and trailers require a minimum of steel, are easy to repair, withstand abuse, and give more hours of service. Quick delivery for essential requirements.



Easy to Assemble

With savings of from 15% to 40% in steel in building combat bodies, made possible by the use of the Lindsay Structure method of construction, the limited supply of steel is being stretched to make extra units.

Lindsay Structure stretches steel, too—to get all the strength in light sheet steel. That's why Lindsay Structure frameless trailers are in successful use by the U.S. Army. They withstand the blistering heat of the desert . . . the cold of the arctic . . . the humidity and termites of the jungles . . . the strain and wracking of operation over shell holes, rocks, and soft sand.

Lindsay Structure combat bodies can be shipped k.d. in minimum space. That's a vitally important extra value of Lindsay Structure today, when supply lines are thousands of miles long . . . and cargo space so urgently needed.

If you have problems of weight or strength or shipping space in connection with the essential housings, partitions, buildings, or combat bodies that you are building...investigate Lindsay Structure. Lindsay and Lindsay, 222 W. Adams St., Chicago 6, Ill.; or 60 E. 42nd St., New York 17, N. Y.

LINDSAY STRUCTURE

U. S. Patents 2017629, 2263510, 2263511
U. S. and Foreign Patents and Patents Pending
For details, see Sweet's Catalog File

LINDSAY STRUCTURE CAN SAVE THOUSANDS OF TONS OF STEEL PER MONTH

40 • General News

to be enforced without the compulsion of a brownout order has not yet been explained.

• Start in September—The program drawn up for the joint industry-government campaign will be submitted to the informal utility industry advisory committee. Thereafter, possibly by Sept. 1, the drive will be formally launched.

Thus far the industry is unanimous on one point—that it doesn't want to go to all this trouble unless other wasteful practices are attacked equally as determinedly as they plan to go after nonessential lighting.

Go North!

United States and Canada cooperate in opening up a new frontier on route of today's troop movements to Alaska.

Industrialists in Seattle, Portland, and Vancouver, B. C., are checking latest developments in the little-publicized but highly important efforts of the United States and Canada to open up the wide and wealthy wilderness which ranges northward from the railheads in British Columbia to the Arctic Ocean and westward to Bering Strait.

• Unified Program—Those who have watched the development closely believe that exploitation of the area's resources is proceeding at such a rate that the U. S. and Canada may set up an international coordinating organization. A few of the projects now under way are purely of military value but nearly every one—airfields, port improvements, barge facilities, pipelines—will be permanently useful.

This month no less than eight field parties entered the rugged country to make geological, forestry, soil, ecological, land use, and related surveys. The Army is cooperating by hedge-hopping the parties from lake to lake on pontoon-equipped planes.

• Ticklish Job—The North Pacific Planning Project was quietly set up a few months ago by the joint economic committees of Canada and the United States. At its headquarters in Portland, Ore., the group is working out an administrative plan, to be submitted to Washington and Ottawa. Toughest part of the job is to find a method that will best harness for war and peace the resources of the region without compromising the sovereignties of the two nations or short-circuiting established diplomatic and legislative processes. Several possibilities are being considered:

(1) Separate commissions to plan and administer for various resources and their development (e.g., international fisheries commissions).

(2) Action under existing governmental

Business Week • July 10, 1943

SEALS FOR SHAFTS...

1/16 inch to 16 inches in Diameter



Wherever a rotating shaft must be sealed gas- or liquid-tight, as in refrigerator compressors, air compressors, pumps, washing machines, hydraulic transmissions, etc., Sylphon Shaft Seals are standard equipment with many manufacturers.

Specially-engineered for each individual seal application, Sylphon Seals are available in almost any size as illustrated by the two extremes pictured—one for a tiny $1/16$ -inch instrument shaft, the other sealing a giant 16-inch diameter shaft for a secret military application.

How about pressures? Sylphon Seals are finely machined and carefully balanced to afford a perfect seal against any pressure up to hundreds of pounds, with the minimum of friction.

How about shaft speeds? Sylphon Seals are most generally used for shaft speeds up to 400 RPM but have been successfully used on much higher speeds.

The bellows is the secret of success. The famous Sylphon Seamless Metal Bellows made Sylphon Shaft Seals possible—is responsible for the dependable, trouble-free, long life of Sylphon Seals on the job.

What are your shaft sealing problems? Our engineers who have specialized in this subject for many years offer you their accumulated experience to help you solve them. Write for Bulletin NV 825.



THE FULTON SYLPHON CO.
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ALBERTA BOOM TOWN

There's no busier city in western Canada than Edmonton, Alta., air crossroad, base of the Alaska highway, and jumping-off point for builders of roads, pipelines, airfields, oil refineries, and other war projects. In little over a year, 50,000 newcomers settled in Alberta, more than half in Edmonton. Bank clearances have risen from \$18,000,000 a month in 1940 to \$28,000,000. To handle the influx of workers, Edmonton's Chamber of Commerce established an Emergency Accommodation Bureau, but when people began to talk of sleeping standing up in closets, Canada's government agency, Wartime Housing, Ltd., moved in. Priorities for private construction of 200 homes have been issued, and Wartime Housing itself

will bring in 200 prefabricated houses to relieve the situation before winter. Construction companies based in Edmonton have had to improvise headquarters. The Metcalfe-Hamilton-Kansas City Bridge Co. found the Empire Theatre convertible (above

left). The Utah Construction Co. threw up a U-shaped office-barrack in a vacant lot (above right). Some trucking depots are in garages and filling stations, but one landed in a city park (below) where a nearby curling rink provided warehouse space.



departments, with coordinating machinery in the field.

(3) Development corporation or authority, jointly chartered by the two nations, perhaps with certain similarities to the Tennessee Valley Authority, or, to draw on earlier examples, the Hudson's Bay Co., or the British East India companies.

• **The Men in Charge**—Codirector for Canada is Dr. Charles Camsell, authority on the Far North, who has been deputy minister of the Dominion's Dept. of Mines & Resources since 1920. Camsell was one of the first white children born in the Yukon Territory. Codirector for this country is James C. Rettie, who left a Fossil (Ore.) sheep ranch to study at the London School of Economics and has been serving as counselor of the defunct National Resources Planning Board's regional office in Alaska.

Grand-strategists have two principal objectives in pushing the development of the wilderness area: to get minerals, oil, and other resources immediately for prosecution of the war, and to guard

the northern "march" of the continent. • **Many Critical Metals**—Up until now, only fragments of the enormous area have been scientifically studied. It is known that there are deposits (of varying value) of coal, copper, chrome, molybdenite, nickel, tin, lead, zinc, and tungsten, but little is known of their extent. By the time next autumn's snows fly, the geologists hope to have applied a yardstick to many of the resources that are needed for wartime production.

The Canadian government is accelerating its mineral exploration work, particularly along the new Alaska highway. A group of experienced geologists has been assigned to work its way from the foot of the highway to the Alaska border.

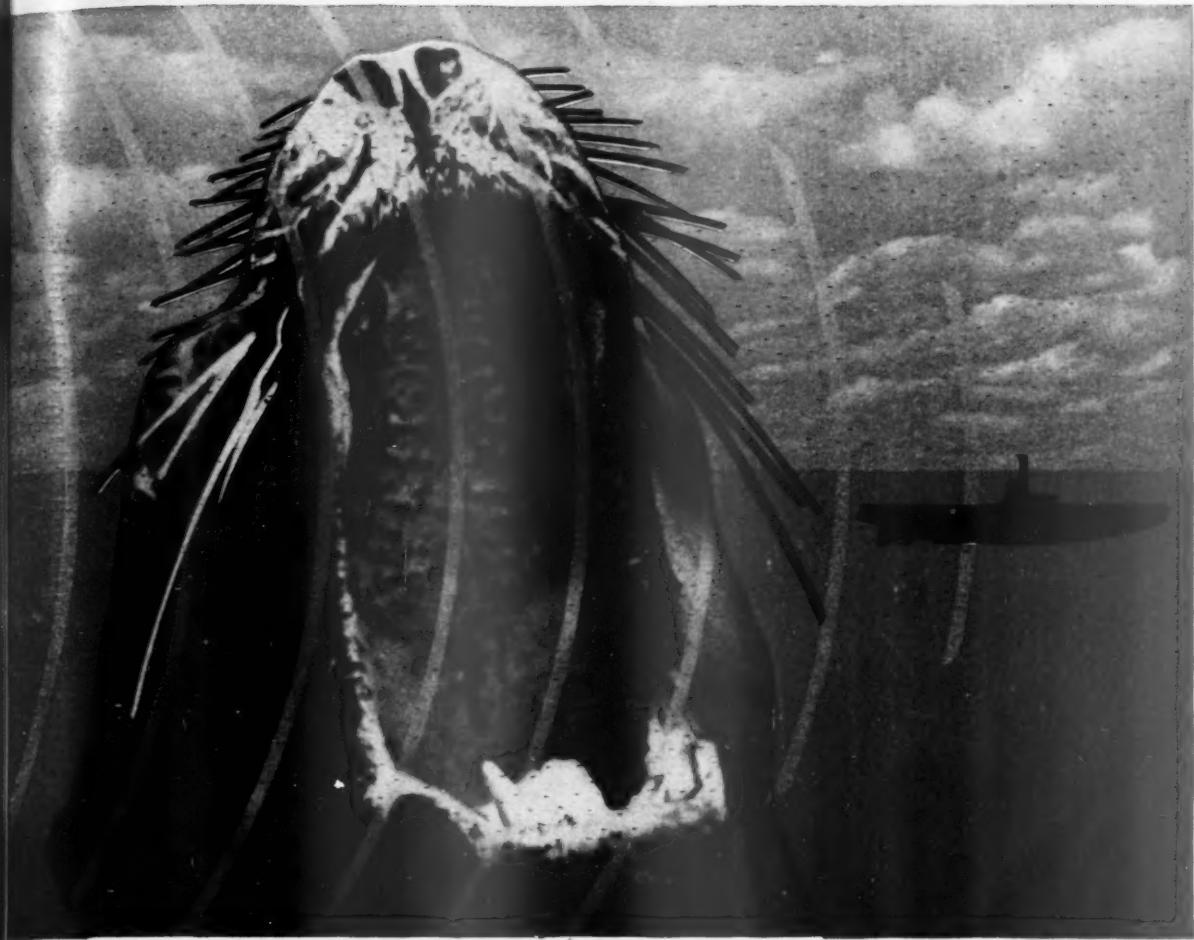
• **Big Quicksilver Strike**—As an example of what can be done, Dr. Camsell points to the recent discovery by a Canadian government geologist of a cinnabar deposit in the Pinchi Lake region which already has, he says, a daily output sufficient to supply all the mercury re-

quirements of both Canada and Great Britain.

On the edge of the North Pacific project area, the Dominion government is expanding, for commercial production, a pilot plant which has been operating in the fabulous Athabasca tar sand reserve of northern Alberta. This yields asphalt for surfacing the Alaska highway, and currently the pilot plant is washing, by a hot-water process, 20 barrels of crude oil a day from the sands. Some estimates place the volume of the oil-equivalent of the sands at from 10 to 250 billion barrels.

Farther north, near the Arctic Circle, the U. S. Army is winning a gamble in oil. Last year, with the Japs menacing Alaska, the Army had no time to sink exploratory wells for the fuel it needed to back up the northern forces. The Army decided to bank on Canada's Fort Norman field, which was yielding a small amount of oil, and to develop a full blast. The Army's first wells produced so much that drilling was intensified.

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Spotter for undersea raiders...

SEA LIONS beat their cousins, the seals, out of an important job during the early part of World War I. Both have a hoarse, barking voice. But sea lions have sensitive, external ears...seals do not.

So sea lions got the job of detecting U-boats. They were trained to bark like fury whenever they heard the vibrations of an approaching undersea raider.

Today, there are many devices for detecting the approach of submarines, but none of them depends on animals. All either depend on machines, or they are constructed with the help of machines.

The heavy responsibility of these machines is illustrated by the fact that during the last war, German U-boats destroyed 5,408 vessels, or 11,189,000 gross

tons of shipping. Today, Germany is building 20 submarines a month, each of which can potentially sink, on a single raiding trip, as many as 14 ships!

But this is only one of the wartime responsibilities of the machine tool industry. Our nation's production of airplanes, tanks, jeeps, anti-aircraft guns and munitions—all this stems from machine tools.

In wartime production, when speed is vital, the output of Cone Multiple Spindle Automatic Lathes is of especial importance. These machines can, in many operations, increase the production range as much as 10 times, depending on the character of the work. This is one of the reasons why Cone Automatics will continue to make money after victory is won.

ONE Automatic Machine Company, Inc., Windsor, Vermont

FOOD

Problem in Fish

They sell so well fresh—and at such good prices—that OPA ceilings are essential to get supply for canners, freezers.

When the government quit taking 60% of the tuna pack June 27, it released for civilian consumption about 25,000,000 lb. that will be caught and put into 1,190,476 cases of 48 cans each. Yet the over-all outlook for the canned fish industry isn't going to be really bright unless the sardine and salmon runs are big.

Last week Harold Ickes, as Coordinator of Fisheries, took complete control over the catching and delivery of West Coast pilchards. His action is designed to increase the yield of pilchards by placing the available boats and men in waters where the most fish can be caught and directing the flow of raw fish to the plants that are ready to handle them.

• Waiting for Sardines—The biggest fish pack in the U. S. is of pilchards or California sardines whose canning season won't start until Aug. 1, and the next largest, Alaska salmon, is just getting under way. The early Maine sardine sea-

son showed catches that were 30% normal. Since Apr. 1, the government has been taking 55% of the salmon, sardine, mackerel, and shrimp pack for military uses.

Labor shortages and fewer boats were expected to cut down the shrimp catch but a new factor is now clouding expectations—higher prices for fresh shrimp. Handlers who sell both fresh and canned products are shipping fresh shrimp to market. Maine has reported labor shortages in its sardine industries, and California is expecting similar difficulties unless Mexicans can be imported to help out.

• Past Years' Figures—Last year's grand total of canned fish, measured in 48-can standard cases, was 17,900,000; in 1941 it was 23,555,321. Although years differ greatly in how many fish are caught or canned, a partial breakdown shows the pack in cases as:

	1942	1941
Salmon (Alaska).....	5,072,953	6,932,04
Salmon (U.S.).....	759,033	899,50
Sardines (Maine and New Hampshire)	2,618,000	3,131,27
Sardines (California and Oregon)	3,790,000	5,007,15
Tuna and tuna-like fishes..	2,538,000	2,931,56

Heavy fresh fish consumption is cutting into the frozen fish business. Present stocks are only 54% of last year's and operators of freezing plants have found themselves unable to compete.



DEATH TAKES A HOLIDAY

Home on the range is getting a bit crowded these days as a jam of cattle builds up from producers' refusal to ship their stock to market, preferring to wait out the price situation. Meanwhile, with beef slaughter off better than 40%, meat herds are enjoying

a rare reprieve but none with more solid comfort than high-priced white-faced Herefords in the rich Blacklands of Central Texas. As the temperature there continually hits 100 in the shade, producers keep their valuable breeding stock in air-conditioned barns (above) during the day, let them out only in the cool of the night to feed



YOU'RE LOOKING AT . . .

4 OF 8 REASONS WHY

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Why DeLuxe stands number one in fleet operators' preference . . . why the trend to DeLuxe is so marked in Industry . . . why DeLuxe is adopted as original equipment by many engine builders . . . is explained by DeLuxe's unique and exclusive construction. 8 features, all of which are found only in the DeLuxe Filter, make possible the *actual cleansing* of asphaltenes from oil before they can form into sludge and other harmful substances. In terms of lower oil costs . . . less engine wear and repair . . . longer cartridge life, it will pay you to get all the facts about DeLuxe Oil Cleansing. DeLuxe Products Corp., 1425 Lake Street, La Porte, Indiana.



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• Mobilift keeps battle-bound materials flowing through our army warehouses throughout the world. Loading, stacking, moving supplies—saving vital space, time and manpower—Mobilift breaks the bottlenecks that slow down wartime schedules.

Private industry, too, is using Mobilift to speed up wartime movement of merchandise. And though a big part of our production now goes to the army, a part of our output is being allotted for essential war industries—to plan for the future when Mobilift will again be ready to take its full part in peacetime transportation. Plan now to use Mobilift to break the bottlenecks of your inside transportation system.

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46 • Food

with the prices fishermen have been getting in fresh fish markets. But an OPA order, effective July 13, placing ceilings on some fresh fish may make it less difficult to get enough to freeze.

• **Frozen Fish Supply**—With only 34,388,272 lb. of frozen fish and shellfish in storage June 1, monthly additions are running about 85% of normal—sharpest decline being of haddock and rockfish fillets. Frozen halibut is 57% of last year's supply, mackerel 55%, whiting 48%, king salmon 23%, silver salmon 18%, swordfish 36%, lake herring 22%, lake trout 23%, scallops 15%, and shrimp 43%. The outstanding exception is sea and river herring with holdings of 3,148,799 lb. compared to 1,242,264 lb. last year.

Pigs in a Pickle

Hog prices decline below government support levels, and officials, rather than worrying, are perhaps a bit pleased.

Government price supports for farm products were found wanting last week when markets on potatoes and hogs declined below support levels. The War Food Administration bought a few early potatoes for relief distribution to hospitals but did nothing about hogs.

• **Might Wink at Drop**—Inquiry revealed that the food agency had no planned program for making good its promised hog price support; implicit, instead, was the suggestion that a further break of a dollar or so in hog prices would not be unwelcome. This might drive some corn out of hiding because of the less profitable corn-hog relationship.

As for potatoes, the early ones couldn't be stored or conveniently made into starch or dehydrated; all that could be done at the moment was try charitable distribution in the hope that the price would go up as the surplus went down.

• **History of Hog Program**—Hog production expansion began nearly three years ago when Secretary of Agriculture Claude R. Wickard announced that hogs would be supported at \$9 per hundredweight, Chicago. Feed was plentiful and relatively cheap, and government economists assured Wickard that in a war market the price of hogs couldn't possibly go anywhere but up.

Farmers responded by producing 50,000,000 pigs in the spring of 1941, followed with 36,000,000 more that autumn. Urged on by Wickard, they came through with 60,000,000 in the spring of 1942, and with 44,000,000 additional in autumn.

• **Price Up, Crop Up**—With a hog-corn price ratio of 17 to 1 at that time (long-time average is less than 12 to 1),

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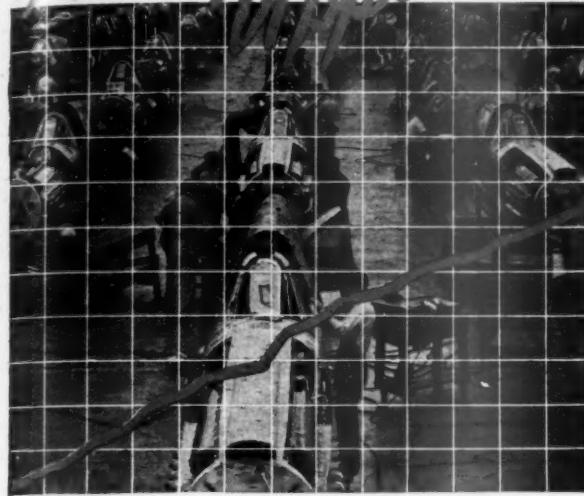
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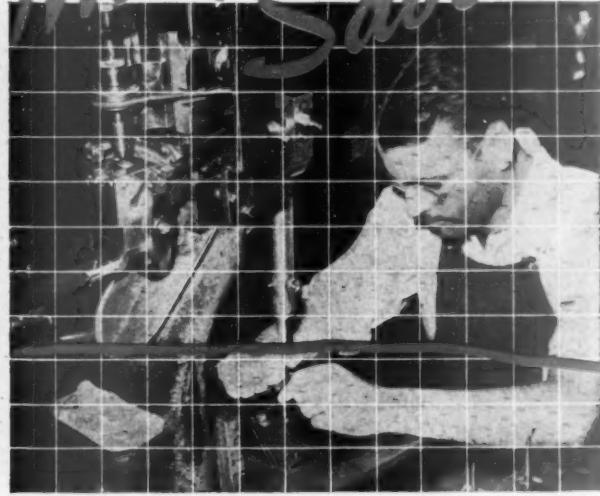
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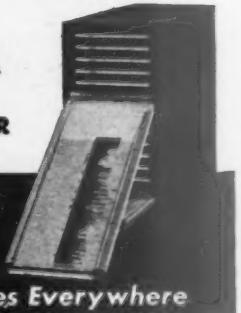
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UNIFORMED FARM HANDS

When labor shortages threatened pea harvest around Rochelle, Ill., recently, a contingent of Wacs from nearby Camp Grant turned the tide of farmers' battle against time. Appearing in

money rolled into the hog belt as never before. And with this incentive, rooted in government reaffirmation of continuing cheap feed and an upping of price support to \$13.25 a hundredweight average for heavy hogs (240 to 270 pounds), Chicago, the farmers went all out on hog production, producing more than 74,000,000 pigs this spring.

In April, the newly created War Food Administration, outdoing the Secretary of Agriculture, promised that heavy hogs would be supported at \$13.75 a hundredweight until Sept. 15, 1944. But the same statement said, inexplicably, that if prices of hogs did not come down it would be necessary to put a ceiling on live pigs.

• **Ideas Are Revised**—Then came the spring floods which were to delay new corn plantings and create the prospect of a feed supply below requirements of this fall and winter. Hurried reappraisal of the corn-hog situation indicated that hogs would outrun the feed supply (the supply of corn may be 15% smaller this season than last, whereas the number of hogs on farms has been forecast at 15% larger next Jan. 1 than last), and Food Administrator Chester Davis urged farmers to increase pig production this autumn by no more than 15% and preferably by only 5%.

Farmers responded with reported intentions to increase the fall pig crop by 21% instead (53,000,000 total as compared with 44,000,000 last fall).

• **New Plan Was Ready**—Only the day before the issuance of the government's latest pig report, a messenger was cycling to the White House with a

their G. I. fatigue uniforms, the auxiliaries drove trucks and tractors, did odd jobs, and inspected plants for root rot, but did no actual harvesting—except (above) for the photographers. Those on "agriculture patrol" had worked or lived on farms.

recommendation to Economic Stabilization Director Fred M. Vinson for an altered price support program on hogs.

The idea was to peg hogs of less than 250 pounds at \$13.75 per hundredweight after Aug. 1, and only hogs of less than 230 pounds after Sept. 15. Heavier weights, representing extra com in the form of fat, would have been on their own.

Have a Whale?

West Coast producers say steaks taste much like round of beef, and shipments now are on way to eastern market.

First refrigerator car shipments of whale meat—60,000 lb., now ready for eastern markets—are rolling out of San Francisco. The meat is being processed for the nation's dinner tables by Maritime Industries, Eureka, Calif., which claims to be the only whaling operation now in business on either coast of North America. Two San Francisco wholesale houses, Western California Fish Co. and Producers Trading Co., will handle national distribution.

• **Flavor Recommended**—Butchers will get the meat in 20-lb. chunks. According to the producers, whale steaks taste much like round of beef. A prime whale supplies around 15 tons of tenderloin 15 ft. thick. OPA has been asked to establish a ceiling of 35¢ a pound.

Bad weather has delayed whaling op-

erations out of Eureka, but, in the last few weeks, Maritime Industries (which also dehydrates whale meat for human consumption) has been processing about 12,000 lb. of fresh meat a day. Soon the company hopes to bring daily output up to 30,000 lb., expects to ship about 3,750,000 lb. from a catch of some 125 whales.

• **And Supply Is Ample**—Spokesmen for Maritime Industries say there are more whales than usual off the California coast this year. Many of them are large, running up to 40 tons.

Incidentally, remembering that whale meat was consumed during the last war but was abandoned by the public as soon as familiar meats became available, Maritime Industries is planning a national advertising campaign designed to create permanent demand.

Big Peanut Crop

Harvest this year will set all-time record and may reach goal of 5½ million acres; plans call for speedy processing.

With harvesting time for America's prospective record peanut crop rapidly approaching, the industry is being put in order in an effort to eliminate some of the confusion and dissatisfaction that has been prevalent in the past.

• **Positive Steps Taken**—Among the things already done in an attempt to simplify the handling of the 5½ million acres of peanuts (a goal many now believe will be reached), two are outstanding: (1) All national marketing quotas and acreage allotments for peanuts produced in 1943 have been terminated by order of the War Food Administration, and (2) Food Order No. 4, making the Commodity Credit Corp. the sole purchaser of farmers' stock 1943-crop, has been issued.

Both actions are for the purpose of encouraging production and facilitating the marketing and processing of the 1943 crop under a one-price system. Last year the two-price "quota" and "excess" method brought much squawking from first-year growers.

• **Marketing Machinery**—The purchase program will be operated by CCC under contracts with handlers who will purchase, store, and sell farmers' stock peanuts only for the account of the corporation. The normal trade channels, including peanut producing cooperative associations, crushers and shellers, will be used as agents under handlers' contracts.

Purchases from producers will be made at uniform prices averaging \$140 a ton for Spanish and Virginia types and \$130 a ton for runner types. These prices are approximately 17% below

Loading Another 5 TONS of ARMY POWER



KEYSTONE Wire

Valuable time is gained loading this 5-ton package of Diesel power. A Tournacrane, equipped with several hundred feet of rugged cable, swings it quickly and easily onto the railroad car. Then comes another and another—ready for a quick trip to a battle area.

In the large number of such cranes located at key points, wire is at war. Wire mill production plays an integral role in planes, tanks, guns, ships and ammunition, too.

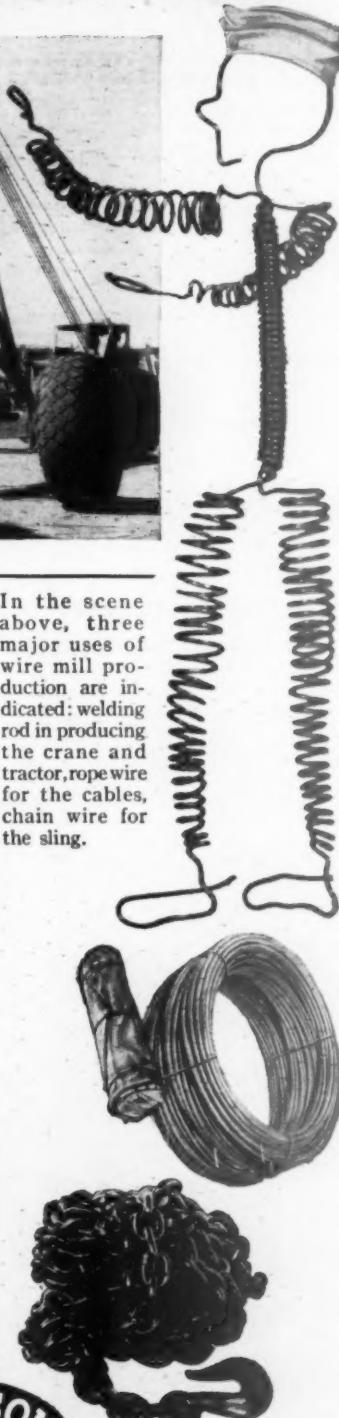
In these unglamorous ways, Keystone is devoting a major share of production to speeding Victory. Then we hope to be able to meet, at least partially, a towering, pent-up civilian demand.

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PEORIA, ILLINOIS

Special Analysis Wire
for All Industrial
Uses



In the scene above, three major uses of wire mill production are indicated: welding rod in producing the crane and tractor, rope wire for the cables, chain wire for the sling.



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In preparation for post-war business, we are now working on ideas to expand our regular line of wrapping machines, and to manufacture and sell other machines used by industries we do not now serve... We believe this offers an opportunity to a forward-looking machinery manufacturer or inventor to collaborate with us on a mutually profitable basis.

We are the leading manufacturers of wrapping machines in the United States. Many of the advancements made in packaging have been the result of work done by our Engineering and Designing Department. In the war effort, too, our creative staff has contributed important inventions that have given added speed and efficiency to the armament program. Our plant is modern and manned by craftsmen of exceptional skill.

If you have an idea for a machine or device which might fit in with our plans, or if you are now manufacturing a machine which you believe could be improved upon and made with greater profit in our plant, we suggest that you write us in as much detail as possible. We can then arrange for a meeting.

PACKAGE MACHINERY COMPANY, Springfield, Massachusetts

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The Globe-Wernicke Co. . . CINCINNATI, O.



HOME-GROWN SPICES

With spice imports slashed by war, American farmers are turning neat profits with domestic crops of coriander, paprika, and sage. Typical is the experience of T. L. Allen (above, right) of Ellis County, Tex. Two years ago he started a few acres of sage which yielded five tons and about \$6,000; this year he has 35 acres, but prices are down. High yield, however, will make up part of the difference, since sage leaves can be harvested three times for a yearly average of about 1,000 lb. per acre.

the ceiling prices for farmers' stock peanuts, but about 75% above the value of peanuts when sold to crushers for oil and meal.

• **Effort to Speed Movement**—Officials expect that the facilities of the peanut shellers and crushers will be utilized from the beginning of the marketing season so as to move the maximum quantity of the peanut crop directly into food and feed channels. Producer cooperative associations, as agents for the CCC, will be authorized to establish receiving points and make available storage facilities for handling the portion of the crop that is not purchased directly by processors.

In a move to assure ample harvesting machinery for the increased acreage planted to peanuts this year, the War Production Board has made available sufficient materials to manufacture 1,324 peanut pickers. Because last year's crop fell half a million acres short of the five-million-acre goal, some 1,400 peanut pickers were carried over from 1942.



VITAMINS GO TO WAR



A BUSINESS WEEK REPORT TO EXECUTIVES

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During the last war, the problem of food supply and the coproblem of an adequate diet for soldiers, sailors, and civilians did not begin to claim the public attention that they are receiving today. Vitamins had barely been recognized as discrete nutritional entities—they were still spelled “vitamines.”

Herbert Hoover gave us our meatless and wheatless days, and we took them in our stride. Nutritionists laid stress on optimum amounts of protein, carbohydrate, fat, calcium, phosphorus, iron, and calories in the daily diet. It all sounded scientific, hence highly worth while, but few of us knew what we were talking about.

A new generation of nutritionists continues the stress on protein, carbohydrate, fat, calcium, phosphorus, and iron; but where their predecessors promoted adequate calories (the units of measure of food as fuel), they also crusade for iodine and vitamins—especially vitamins. And only a few of this generation of laymen know what the nutritionists are talking about. It is all pretty confusing, particularly since most of the writings on the subject are aimed at nutritionists and physicians, hence fall outside the realm of lay experience or lay interests.

“Where,” writes an industrial executive in evident extremis, “can I get the lowdown on this vitamin and nutrition thing? My personnel manager insists that we can cut absenteeism and increase production by providing vitamins for our workers. My factory manager is equally insistent that, if we’re going to spend money, we should subsidize big, well-balanced lunches for the crew. Which man is right? Where can I find something not too technical on vitamins and nutrition generally, to help me arrive at a sound basis for judgment?”

This report does not pretend to provide the industrial executive with all the answers to his call for help. It does, however, attempt to set forth in an unbiased way and in nontechnical language the most recent scientific findings on the what, where, and how-come of vitamins. It also presents a concise, quick-stepping analysis of the competitive alignments in the far-flung, rapidly growing, and, as yet, unintegrated vitamin industry. It has been written solely for the business executive—the manufacturer, the merchant, the manager, the banker, the investor who is seeking background for his business judgments—present and postwar.

VITAMINS GO TO WAR

No products of the chemist's laboratory ever have had a larger opportunity to prove their efficiency than vitamins have today. Shortages in meats, seafoods, dairy products, vegetables, and fruits which normally supply the human diet with its natural vitamin requirements are bound to give processed and synthetically produced vitamins the severest test they have ever had—greater than any previously envisioned by vitamin scientists, enthusiasts, and promoters.

Fisheries, farms, mines, breweries, distilleries, coke ovens, petroleum refineries, heavy chemical plants, and pharmaceutical houses (there is no such thing as a genuinely integrated vitamin industry) will be called upon to raise their production sights and sales quotas. That they can and will do so is attested by the almost fantastic growth in the production of vitamins since 1925, the first year the U. S. Census Bureau took cognizance of them.

However, the \$200,000,000 bogey for 1943 retail vitamin sales set up by several vitamin houses in their current promotions will almost undoubtedly prove too big an order. The public may be willing to lay that amount on the line, but the trade may not be able to pry loose enough vitamins from lend-lease and the bread enrichment program to take care of the business.

Tons for Bread Enrichment

For one thing, it is going to take more than eleven tons of riboflavin (also known as B₂, also G) just to enrich the 40,000,000 bbl. of flour used in one year's home baking after that vitamin is required to be added to the bread enrichment program (July 1 was the date proposed by the Dept. of Agriculture after several postponements made necessary by shortages in riboflavin capacity; now it is again postponed), plus the 15 tons or so of thiamin (B₁) already required. Tonnages of niacin (P-P) and iron (also specified as enrichers) vary with the miller because most flour contains enough of both to meet enrichment standards anyway.

Surprisingly enough, the 60,000,000 bbl. of flour used annually in commercial baking probably will not require as large vitamin tonnages as those used in flour for home baking, because the majority of bakers will not use mill-enriched flour. Thus far they are finding it more economical to build up the major part of the official vitamin and iron quotas with yeast and milk solids, adding only enough processed vitamins to bring each pound of their bread to the tentative official potency of 1 mg. thiamin (1 milligram equals 1/1,000 gram), 4 mg. niacin, and 4 mg. iron per pound. (Riboflavin enrichment is yet to be required for commercial bakers but will probably call for 0.6 mg. per pound of bread.)

To attain a like result in home baking, flour must be enriched at the mill to provide the following minimum in each pound of flour: 1.6 mg. thiamin, 1.2 mg. riboflavin, 6 mg. each of niacin and iron. Washington talk of raising the flour enrichment ante may remain just talk, because of overburdened vitamin production facili-

ties. On the other hand, there is some disposition in the baking industry to believe that each pound of its bread may be required to contain 1.1 mg. thiamin, 0.7 mg. riboflavin, 10 mg. niacin, and 8 mg. iron.

Iron compounds, like sodium iron pyrophosphate (one of the iron carriers used to introduce the metal to the human body in digestible form), are cheap and fairly plentiful. And niacin, at \$5 a pound in large bulk quantities, figures out to just a shade over one one-thousandth cent for each extra milligram of enrichment (it takes 454,000 mg. to make 1 lb.). Neither additive presents much of a commercial problem in the quantities involved.

Baking Is Highly Competitive

But bulk thiamin currently sells at 32¢ to 35¢ a gram; riboflavin sells at 53½¢ to 63½¢ a gram. Hence to raise the ante of each by only 0.1 mg. to a pound of flour increases the cost of a loaf of bread by over 0.1¢, a figure to reckon with in an industry as closely priced as baking. Since the general run of neighborhood bakers would not buy enough vitamins to entitle them to bulk prices, hence would have to pay considerably more to enrich their product, the big fellows in the industry, with their superior buying power, would be given an additional competitive edge.

To hear all the tumult and the shouting about the bread enrichment program (other government food enrichment programs seem to be pigeonholed until vitamin production can be increased), one would think that the three vitamins involved were the only important members of the dietary family and the only ones faced with scarcities of varying degrees. But such thinking would leave out of account equally important and possibly more scarce vitamins A and C.

Provitamins Aren't Vitamins

Vitamin A, as distinguished from the carotene, or provitamin A, of leafy green vegetables and carrots (dairy products, eggs, and meats contain active A), comes from the livers of fish which have eaten their quotas of carotene in marine vegetation or active A in other fish, have transformed the provitamins into vitamins without anybody's knowing just how, and stored them for future use. Active vitamin A differs from provitamin A in that the latter becomes active A only after a chemical change within the digestive apparatus of the eater. It is estimated that a healthy human being is able to convert about 70% of his provitamin intake into active vitamin. Diabetics and chronic liver complainers are less able to make the conversion.

First commercial source of any vitamins was cod liver oil. It provided A, and antirachitic D, for generations of children and adults long before any vitamins were isolated in the laboratory and found to be minute constituents of food without which its proteins, fats, carbohydrates (starches and sugars), and minerals are not transformed by bodily processes into healthy bones, muscles,

nerves, and other tissues. (There is no positive definition of vitamins in terms understandable to the lay public. Vitamins may simply have to remain "without whiches" forever.)

Since many vitamins, and some of the food-borne minerals, act only in the manner of catalysts, or "spark plugs," to facilitate the utilization of foods, vitamins are called "nutrients," as distinguished from nutritives which enter more or less directly into the compositions of various tissues.

War Upset Vitamin A Picture

Of late years, and particularly since Norwegian cod liver oil was cut off by the war, the vitamin extractors and concentrators (there is only one vitamin distiller) have been relying on fish species other than the true cod for their raw materials. Unfortunately for the eastern fisheries, the Atlantic cod found within comparatively submarine-proof distance from our shores produces an oil low in A, averaging little more than 2,000 U.S.P. units per gram. (U. S. Pharmacopoeia units are the same in value as International Units, set up by an International Vitamin Conference in 1934. The reason the units are so infinitesimally small is that they are based on quantities needed to give a small laboratory rat his daily ration of A.) Importations of Japanese high-vitamin tuna liver oil (actually richer in D than in A) stopped, naturally, with Pearl Harbor.

Fortunately for the western fisheries, and for the country, there are several species of Pacific fish on our shores with livers high in A. The huge organs of soup-fin sharks (their livers are sometimes over 2 ft. long and weigh from 6 lb. to 20 lb.) assay about 65% of their bulk in oil containing from 100,000 to 200,000 U.S.P. units of vitamin A per gram (Atlantic sharks, not of the soup-fin family, rarely secrete oil of higher than 25,000-unit potency, do well to average 4,000). Dogfish, which are smaller members of the shark family, naturally grow smaller livers, but their oil is also high in potency.

Pacific ling cod, not a true cod, furnishes oil of exceedingly high potency running sometimes as high as 700,000 units of A per gram, but averaging 200,000 in most years (like grapes of a particular vintage year, fish livers have their years when potency runs higher than in others). Halibut livers, too, run extra high in vitamin content, but they are so small compared with shark livers and caught in such relatively small tonnages that their oil is sold at premium prices to a part of the ethical drug trade which believes only in furnishing refined, unconcentrated oils. Percomorphum livers are in a similar classification.

Freezing for Protection

Whatever the species of fish which furnished them, livers are frozen as quickly as possible after catching and classification, because their vitamin potency is affected by the slightest trace of putrefaction or rancidity. Since fish livers may sell for as high as \$6 a pound, and practically their entire value is in their vitamin content, samples from a catch are rushed to a laboratory to be examined in a spectrograph and their potency determined before they go on the auction block.

A few drops of oil are squeezed out, diluted with absolute alcohol (containing no water), and placed in the beam of a carbon arc light which impinges on a glass "grating" ruled with 24,000 lines to the inch, all precisely parallel. A rainbow results, like that from a prism, but in far more definite colored bands. When these are photographed in tones of black, gray, and white on a fine-grained film, the bands can be compared with those on spectrographic film standards which record oils that have met definite levels of potency in rat-feeding tests. For extra-quick, rough-and-ready tests, to keep up with demands of today's runaway liver market, the rainbow can be thrown directly on a screen and vitamin potencies estimated by comparison with the photographed bands of a single, all-purpose spectrum.

From the spectrograph and auction block, the livers may take either of two routes. They may be shipped whole to vitamin houses which prefer to handle all processing, or may be delivered to commercial extractors which express oil before shipment to refiners and concentrators. Although it is just as easy to concentrate vitamins directly from whole livers as from oil by the saponification process (the molecular distillation process requires oil), many vitamin houses prefer to sidestep a serious refrigerating and storage problem by letting refining and concentrating specialists get in their licks.

Vitamins by Saponification

Saponification involves just what the term implies, soap making. Livers or oils are mixed thoroughly with an alkaline, such as the hydroxide of potassium or sodium. For some mysterious but chemically explainable reason, the fractions of the oil that go into soap contain no vitamins. In other words, all the vitamins A and D follow the nonsaponifiable fraction which is extracted from the whole soapy mass with a solvent. When the solvent is evaporated or otherwise removed, the end product is the oil concentrate, ready for capsulating or tabletting or bottling, with or without other vitamins. Its color, ranging from light to dark amber, its degree of cloudiness (which can be removed if desired by several methods of clarification), and its vitamin potency (from 100,000 to 1,000,000 units a gram), all depend upon the species and liver potency of the fish from which it came.

Molecular distillation also involves what its terminology implies but goes beyond the everyday concept of distilling that just raises a liquid to a boil and condenses its vapors. Liquid fish oils are boiled all right, but under a high degree of vacuum, and at varying degrees of temperature. A low temperature vaporizes one fraction of the oil for condensation; a higher temperature vaporizes another fraction; and so on.

Fraction by fraction and almost molecule by molecule (hence the name, molecular distillation), the oil is separated into its components. Most of the odors and free acids are collected and discarded. Finally there is collected a blend of vitamin A, some inactivated sterols, plus natural antioxidant preservatives for the A, all combined in pure distilled oil. The total recovery represents only 5% to 10% of the original liver oil. Vitamin A content can be controlled within a range from 100,000

How Vitamin Business Has Grown

The vitamin production record, which includes no figures for 1933 and unfortunately ends with 1939 because the war interfered with the publication of later figures, is built up from two sets of U.S. Census figures. Dollar values are wholesale billings (f.o.b. plant) of vitamin products in two census classifications: "Drugs and medicines . . . sold to or prescribed by physicians" (ethical drugs), and "Drugs and medicines in specially prepared packages made for sale to the general public" (proprietary drugs). Percentage figures reveal the relation of vitamin products to drug products as a whole:

1925	\$343,000	0.1%
1927	1,443,000	0.5
1929	4,483,000	1.3
1931	6,039,000	2.1
1935	16,111,000	5.7
1937	27,070,000	8.1
1939	41,644,000	11.7

Large as these dollar figures are, they include neither the vitamins used by the food industry to enrich human food nor those used by the feed industry, such as yeast products and concentrates of fish liver oils, to enrich stock and poultry feeds.

Considering that vitamins frequently go through a complex distribution process on their way to the ultimate consumer, the following figures of annual retail sales of vitamin products (assembled and published recently by Drug Topics) would seem to be in line with the census wholesale figures:

1925	\$685,108
1927	2,886,422
1929	8,967,538
1931	12,079,014
1935	32,223,604
1937	54,197,020
1939	82,724,960

Jumping from 1939 to last year, Drug Topics puts the value of 1942 retail vitamin sales at \$130,896,000, distributed as follows:

Drugstores	\$101,496,000	77.6%
Mail order houses	10,500,000	8.0
Department stores	9,000,000	6.9
Grocers and supermarkets	4,100,000	3.1
Variety stores	2,800,000	2.1
General stores and miscellaneous	3,000,000	2.3
 Totals	\$130,896,000	100.0

to 500,000 units a gram, but the bulk of production is standardized at 200,000 units.

Concentrators using the saponification process are inclined to scoff at some of the claims for product superiority of the only molecular distiller of vitamins (Distillation Products, Inc., jointly owned by Eastman

Kodak and General Mills), but the Research Products Division of General Mills sells at a premium all the A distillates it can produce.

Though the concentrators may sincerely think they have some basis for doubting that the distilled A has the superior stability, biological activity, blandness (freedom from objectionable taste, permitting it to be added to foods previously thought unfortifiable), uniformity of color, potency, etc., claimed for it, there is no doubt that the distiller has one sharp edge on the market. The potencies of its products depend upon neither the species of fish nor, within reason, the vitamin content of its liver. If oil from one species is in short supply, as it often is these days, oil from others can be distilled, provided only that it contains distillable amounts of vitamin.

Ester vs. Ether

A further market edge comes from the laboratory-demonstrable fact that distilled A is in the same natural, organic ester form that it was in the fish, instead of the ether (or alcohol) form as it emerges from saponification. Only a graduate chemist understands the difference, and he can't explain it in lay language. It is enough to say that the ester form stands up better under heat and aging, is possibly more readily assimilated by the human body.

Although fish liver oils are the principal commercial sources of vitamin A and, as such, dominate 99% of the market, more and more provitamin A in the form of carotene is being extracted directly from alfalfa, carrots, grass, and other vegetation, for enriching processed foods. Because of its rich carotene color, carotene is a natural for winter butter, which tends to be an unappetizing off-white; it both adds salable golden tint and braces up the provitamin content during a time when cows are not getting pasturage, hence are not getting their normal quotas of carotene from green fodder.

Dairymen Hesitate

One thing that holds back the use of carotene in butter, packaged cereal foods, etc., is the pretty well demonstrated rule that it takes 7,000 units of provitamin A in carotene to equal the nutrient efficiency of 5,000 units of active A in oil concentrates. Then too, the normal A content in butter has been activated from carotene in the course of the cow's milk and cream production, and some dairymen hesitate, probably for no basically sound reason, to mix provitamin with vitamin.

Synthetic vitamin A, which cannot be distinguished from the pale yellow, viscous liquid that is extracted from fish livers, because they are chemically identical, has been produced in the laboratory. Thus far, and until a much less costly synthesis is worked out, the man-made product has little hope of going into competition with nature's own in the relief of night-blindness and other eye troubles, in building some degree of resistance to colds and other infections, and in helping to clear up certain skin disorders.

Back in the days when Norwegian cod liver oil was practically the only commercial and therapeutic source

of vitamin A, there was little concern about the supply of vitamin D (infrequently called "calciferol"), because the oil also furnished a high content of the latter. Japanese tuna fish livers, and those of certain other members of the mackerel family, supplied even more D. But when the war forced fisheries to turn to still other species, vitamin extractors and concentrators soon found that the ratio of D to A was anything but a constant. In fact there is no D in the liver of the shark, a phenomenon which may account for its having no bones in its carcass, but only cartilage.

Vitamin D by Irradiation

Long before any war-induced shortage in D had a chance to appear, Dr. Harry Steenbock, the Wisconsin University professor who had previously found that growth-stimulating provitamin A could be separated from certain plant materials and added artificially to foods, discovered that when various foods were irradiated with ultraviolet rays, photochemical changes took place, transforming some of the fat-like sterols in the composition of the foods into the identical vitamin D which induces strong bones and sound teeth. He applied for and got a basic U. S. patent.

While his patent was still in the application stage, but not before several entrepreneurs had sought to exploit his process, he assigned it to the Wisconsin Alumni Research Foundation which was organized specifically to protect and promote it and other patents that might come its way, and to devote profits from their licensing to scientific research. Irradiation is so inexpensive, and royalty fees have been kept so low, that the treatment has practically never increased the sales prices of foods.

No figures are available on the total royalties from the Steenbock patent alone, but profits from all its patents enabled the foundation to donate \$1,364,958 to Wisconsin University for science research during the first 16 years of its operation, to say nothing of a far larger amount used to finance its own research projects, its well-equipped, air-conditioned laboratory, various legal fees arising out of patent litigation, etc. Although the Steenbock patent has been attacked on the ground that ultraviolet from man-made lamps may be said to duplicate the job done by the sun with its ultraviolet, the courts had upheld it until last week when a federal circuit court reversed a sustaining decision.

Many Foods Irradiated

Research subsequent to that leading up to the Steenbock patent revealed that irradiation would produce vitamin D not only in milk, yeast, bread, breakfast cereals, and other foods, including various food and drug preparations intended for invalids and children, but even more potently in ergosterol. (It could also add D to cosmetics, sausages, and other items if the foundation would permit; it probably will when the original patent expires in 1945. Already there is an electronic method of irradiation, described in the Milas patent, owned and used by General Mills.) Ergosterol is a fatlike sterol isolated originally from the fungus ergot, but now extracted commercially from yeast.

Irradiated ergosterol is now usually marketed under less unwieldy name, viosterol, but it is often referred to by scientists as vitamin D₂ to differentiate it from the original D found in cod liver oil and the D₃ obtained by irradiating cholesterol. Though ergosterol can be irradiated to potencies as high as 400,000 U.S.P. units a gram, most drugstore viosterol is held to about 10,000 units. Reason for holding down potency is an excellent one, in that vitamin D is such an active aid to the deposition of calcium in the body that overdoses have been known to go beyond strengthening bones and teeth to cause hardening of the arteries. There is at least one instance of arteriosclerosis having been induced temporarily in a tiny baby.

Irradiated ergosterol, D₂, has all the calcium-depositing potency of fish liver D when fed to human beings and other mammals but, for some obscure biological reason, fails as a poultry nutrient. Both du Pont and Winthrop got to work on the problem and licked it with an irradiated sterol of animal origin (based mainly on brain and nerve tissue obtained from meat packers). Known commercially as du Pont Delsterol and Winthrop Drisole (there is some sort of cross-licensing arrangement) and scientifically as D₃, the material is being produced in quantities sufficient to relieve some of the pressure on fish liver oil, to help maintain egg production, and to help build sound, undistorted bones in millions of growing chicks. Though it would work equally as well for human beings, it is not now made for them, probably because of price considerations.

Incidentally, if you never gave your dog a bath, you probably would never have to buy vitamin D for him.



Big testing laboratories like that of I. F. Laucks, Inc., determine the vitamin content and price of fish livers. Shark livers run from a few inches long to over two feet.

The ultraviolet of the sun irradiates sterols in his hair (as it does sterols in human skin) to produce a kind of D which he gets into his system by licking his coat.

Vitamin E (called "X" for a while, and now alpha-tocopherol, particularly in the synthetic but chemically identical form) is the third of the five fat-soluble vitamins (A, D, E, K, and possibly F), so called because they are insoluble in water, but soluble in most of the usual fat solvents such as alcohol and petroleum derivatives. Some time after it was first isolated a decade ago and found to have something to do with the reproductive ability of laboratory rats, E got a lot of publicity as the "antisterility vitamin." Writers had a field day drawing unwarranted conclusions. Consequence was it obtained considerable undeserved note as an aphrodisiac and restorer of male vigor and built up temporary business for drugstores and flour millers. (The latter furnish wheat germs and wheat-germ oil, the most potent natural source of E.)

E Business on Upgrade

Further consequence was that it took several years for the lay and medical public to catch up with E's true worth as an antiabortion factor in certain female animals, as a preventer of miscarriage in women, and as a nutritional factor in the normal growth of muscle tissue and the prevention of muscular atrophy after accident and disease. Now business is again on the upgrade with considerable quantities being sold to farmers for their livestock, to pregnant women, and to the military services (for administration to the wounded).

Bulk tocopherol (the alpha part of the name is customarily dropped for convenience) comes to market in three principal forms: wheat-germ oil expressed from natural germs; "distilled natural mixed tocopherol concentrates" (called Vegol by Distillation Products, which produces them from undisclosed vegetable oils by its previously described process of molecular distillation); and synthetic tocopherol. How the latter is put together can only be described roughly as the fusion of phytol (a product of alfalfa similar to the green chlorophyl in grass) with a benzene-ring compound extracted from coal tar. Acetic acid, ether, and nitrogen gas are used at one point or another in the process. Ether for example is used only as a solvent, then evaporated and recovered for re-use.

Whatever the exact sequence of ingredients, the end product is a light yellow oil, identical in all respects to the natural E found in wheat-germ oil, and for that matter in the oils found in green lettuce leaves, beef liver, egg yolk, field pea seedlings, and most cereal germs including rice and cottonseed germs.

Unlike A and D, which are measured and sold in U.S.P. units, E is mainly weighed and sold by the metric system. Since it is present in a wide variety of human foodstuffs, and healthy people are able to absorb sufficient quantities in their three squares daily, neither minimum nor optimum requirements have been established by nutritionists.

Vitamin K (frequently confused with its substitute, "menadione"), the fourth in the fat-soluble series, is really of medical interest only. Though it was publicized some

years back as the "antihemorrhage vitamin" and a specific for hemophilia (the hereditary bleeding disease), it has been found to have no effect on that kind of bleeding, or for that matter on the kinds associated with scurvy, aplastic anemia, etc. It is a specific against intracranial hemorrhage in a newborn infant, if administered hypodermically to the mother about a half hour before delivery. Fed to the mother in advance of the event, it appears to have little effect. K is also considered useful in the treatment of certain types of jaundice and the alleviation of the bleeding associated with several intestinal tract diseases.

Menadione Replaces Vitamin K

Although K is found naturally in hog liver and in several green plants, such as cabbage, spinach, and alfalfa, its extraction in the pure form (usually from alfalfa) is so expensive that the medical world has turned largely to another antihemorrhagic compound, 2-methyl-1,4-naphthoquinone. Nicknamed "menadione" by the American Medical Assn., the chemical is a product of chemical synthesis similar to that used in manufacturing photographic developers of the quinone type.

It is not true vitamin K, yet its effects on the human body are so identical that most physicians, and at least one pharmaceutical house, call it either menadione or K as suits their convenience. Though it is not chemically the same as K and may differ considerably from an antihemorrhagic substance produced by friendly bacteria in healthy human intestines, all three promote the normal clotting of blood.

Vitamin F, considered by some to be the fifth and last in the fat-soluble series, has not really been isolated. It may or may not be a true vitamin. Up to now, F seems to be a convenient shorthand expression used by some nutritionists for food factors they call "essential fatty acids." Apparently there is quite a supply of them, or it, in lard, olive oil, corn oil, peanut oil, and some others, and very little, if any, in butter, coconut oil, and palm oil.

Vitamin B Becomes Complex

Two decades ago, vitamin B was generally considered a single entity. Yeast and liver seemed to contain it in abundance; natural unmilled grains, peanuts, pork, and beans seemed to provide adequate supplies. But researchers then began to suspect that some strains of yeast produced different effects on experimental animals, including human beings, from other strains; grains grown under certain conditions of soil and weather differed in vitamin content and effect from the same species grown under other conditions.

Consequence is that they have discovered during 20 years of tough research in thousands of laboratories and clinics that B is no single entity, but B-complex. It is now believed to contain at least 14 nutrient factors of which nine have been more or less definitely isolated and tested:

(1) Thiamin (or thiamine) hydrochloride (B₁)—the so-called antineuritic and "morale" factor; a specific against beriberi; a help in relieving both alcoholic hangover and (in combination with other vitamins) the "neurasthenic symptoms" of tension, insomnia, irritation, weakness, loss of appetite, heart irregularities, various aches and pains.

(2) Riboflavin (B₂ or G)—the "growth factor," apparently vital alike to children, chicks, and young animals generally; important to adults in preventing eye fatigue and soreness, photophobia (painful sensitivity to light), headaches, sores in the corners and interiors of the eyes and mouth (riboflavin is now widely believed to attain maximum efficiency only in combination with vitamin A and niacin).

(3) Niacin (P-P or nicotinic acid), now generally furnished in the amide form and then called niacinamide, or nicotinamide—the "antipellagra factor" (and specific for pellagra's characteristic "three D's"—diarrhea, dermatitis, and dementia) so vital to the undernourished poor; a specific against blacktongue in dogs and possibly other animals; a reliever of neurasthenic symptoms, particularly in combination with A and B₂.

(4) Pyridoxine (or pyridoxin) hydrochloride (B₆, but now usually called just plain pyridoxine)—the "antidermatitic factor," which apparently has something to do with the bodily utilization of "vitamin F," or essential fatty acids, assists other vitamins in keeping the skin in good shape; a cooperator with niacin in relieving the nervousness, pain, weakness, difficulty in walking, etc., associated with pellagra; a help in the treatment and relief of shaking palsy.

(5) Pantothenic acid (used most generally in the form of calcium pantothenate, infrequently as sodium pantothenate)—an "antigray-hair factor," yet to be proven as effective for human beings as for rats; full importance in human diet not yet known, but apparently has something to do with proper functioning of the adrenals and other endocrine glands, and the utilization of riboflavin and other vitamins.

(6) Para-aminobenzoic acid—another so-called antigray-hair factor, not yet proven for human beings; apparently most effective in cats, mice, and rats when administered in combination with pantothenic acid and biotin; may be another human growth factor (as it is surely in chicks) and an aid to lactation in nursing mothers.

(7) Inositol—the "antibaldness factor," likewise unproven for human beings, but effective in curing nutritional baldness, or alopecia, in mice; a cure for "spectacled eye" in rats, and may prove of aid in certain human liver complaints.

(8) Biotin (H)—the "anti-egg-white injury factor" for protecting laboratory rats against a dermatitis produced by eating uncooked egg white, and also a growth factor in chicks, thus of indirect importance to human beings. Of more direct importance is its essentiality in the growth of yeast, mold, and bacteria used in the food, beverage, and bacteriological industries, and the possibility that its lack may predispose human beings to malaria.

(9) Choline—a growth factor in puppies, a health factor in chicks; may have something to do with sugar metabolism and "fat transport" in the human body, hence a factor in preventing liver troubles in diabetics.

All nine members or more of the B-complex may or may not be found naturally in a particular strain of yeast, but that seems to be a minor problem to the yeast industry. Its laboratories have become so adept in the selection and feeding of the industry's pedigreed strains of micro-

scopic vegetables (some of the bakers', brewers', and vintners' yeasts have family trees far taller than any socialite's) that it can produce more or less thiamin in a given batch, more or less riboflavin, etc. Roughly, the objectives are gained by adding more or less of natural yeast foods to the liquid medium which is food and domicile alike—molasses, corn mash, rye mash, lactic acid, synthetic urea.

And if the yeast refuses to produce the vitamin content desired, it can be fortified with natural vitamins or synthetics (usually but not always members of the B-complex), some of them being added to its food during the process of growth by budding, others added while it is being processed into cake, powder, tablet, or capsule form.

Synthetics Use Natural Materials

Synthesis of most of the five B vitamins thus far produced by man—thiamin, riboflavin, niacin, pyridoxine, pantothenic acid—is even more complicated than the process of steering yeast into good eating habits. All depend for their origin upon natural materials, any lack of which would cause still further complications.

Thiamin, which at one time was extracted laboriously from rice hulls with a recovery of less than $\frac{1}{2}$ oz. to the ton, and would be almost as difficult to extract from yeast, is now produced synthetically in almost any quantity desired. (Even so, at least one manufacturer still makes an extract from rice hulls containing the B-complex.) The grayish white, crystalline powder (which has the smell and taste of certain yeasts) is the end product of a series of dissolvings, cookings, filterings, crystallizings, and centrifugings too complicated for detailed description.

One tonnage producer starts out with acetic acid, formic acid, ammonia, alcohol, sodium sulphide, and some undisclosed materials, puts them through about 20 individual steps over a period of weeks, and ends up with thiamin hydrochloride. It could just as well be in the hydrobromide form, if bromine were as easy and cheap to extract from sea water as chlorine is from common salt found in mines or in the brine of wells. Since pure thiamin is pretty unstable, and its stable hydrochloride is exactly as good a nutrient, practically all commercial thiamin is the latter, whether specifically so designated or not.

The only other tonnage producer (a third is just getting started in production) starts out with acetic acid, ammonia, calcium chloride, a caustic, acetone, and probably some others (but no formic acid), puts them through 14 steps over a period of six or seven weeks, and ends up with thiamin hydrochloride. Peculiarly enough, the kind and cost of raw materials is somewhat less important to the prosperity of a chemical organization than the number of steps through which they are passed.

Materials Added and Subtracted

Materials are not all dumped together at once, but rather added or subtracted during successive steps in various types of apparatus—steam-jacketed kettles, fermentation vats, crystallizers. Solvents, like alcohol and acetone, scarcely enter into the end product at all but are distilled or evaporated out and recovered for use again either in a given batch or in future batches. Percentage

1943 ABC of Nutrition

Unlike the traditional division of the American diet into "meat, potatoes, and fixings," all modern diet is divided somewhat roughly by professional nutritionists into "nutritives" and "nutrients." Nutritives are body builders and energy producers; nutrients are the "catalysts," or vitamin constituents of food without which proteins, carbohydrates, fats, and minerals would not become healthy bone, muscle, nerve tissue, skin, energy, and so on.

Although vitamin A enters the composition of the "visual purple" in the retina of the eye, and thus might be considered a nutritive, it is listed as a nutrient—which it mainly is. Although iodine controls the thyroid gland, probably without entering into its composition, and thus might be considered a nutrient, it is listed as a nutritive—which it probably is not.

NUTRITIVES

Proteins—Builders and repairers of muscle and other tissue, and, to some degree, providers of energy. Indispensable to good, strong muscles, and a must for replacing body tissues lost daily through work, wear, and tear. Best sources: meat, fish, fowl, eggs, dairy products, soy beans, navy beans, peas.

Carbohydrates (starches and sugars)—Fuel for fighters and workers. They give the human machine much of its energy. Best sources: bread, potatoes, noodles, spaghetti, cereals, candy, ice cream, cake, cookies, pies, and all things sweet, except chemicals like saccharin. **Fats**—Likewise fuel for fighters and workers. In addition, they help to lubricate joints and muscles. They are almost too readily stored by the body but help to keep it insulated against cold and hard knocks. Best sources: fatty meats, butter, cream, ice cream, cooking and salad oils, gravy, pie.

Minerals—Calcium and phosphorus are needed chiefly for forming and repairing bones and teeth; best sources are dairy products, foods made with milk and cheese, meat, vegetables. Iron and copper make red blood; without them anemia develops; best sources are liver, kidney, heart, leafy green vegetables, dried and fresh fruits. Iodine prevents simple goiter; best sources: iodized salt, oysters, fish, and other sea foods. Other minerals, such as manganese, magnesium, and sodium, present in common foods, are probably all needed by the body, but little is known about them nutritionally.

NUTRIENTS

Vitamin A—Helps to keep eyes and skin healthy, promotes growth in children, increases life span in adults. Mild deficiency shows up in decreased vision in dim light; severe deficiency results in night blindness accompanied by digestive upsets, dry, roughened skin, and dry, sore, itching eyes. Best natural sources: fish liver oils, beef and pork liver, dairy products, egg yolks, apricots, peaches, carrots, peppers, peas, sweet potatoes,

green or yellow vegetables that grow above ground. **Vitamin B₁** (thiamin)—Promotes good appetite, sound nerves, and a sense of well being. Mild deficiency sometimes results in emotional instability and that "tired feeling;" severe deficiency contributes to neuritis (inflammation of the nerves) and may result in beri-beri. Best natural sources: yeast, liver, peanuts, wheat germ, whole grain cereals, whole wheat and enriched bread, egg yolk, soybeans, leafy vegetables.

Vitamin B₂ (riboflavin)—Encourages healthy skin and eyes (particularly in combination with A and other vitamins). Mild deficiency likely to result in eye fatigue, photophobia (painful sensitivity to light), frontal headaches; severe deficiency may result in "pink eye," sore mouth and tongue, may even contribute to cataracts. Best natural sources: liver, heart, kidney, eggs, lean meat, dairy products, peanuts, leafy vegetables.

Niacin (vitamin P-P, or nicotinic acid)—Helps maintain normal cell metabolism and sound nerves. Mild deficiency may result in vague feelings of lack of energy, worry, restlessness, and irritability; severe deficiency results in pellagra which is marked by spottily flushed hands and face, diarrhea, and dementia. Best natural sources: soybeans, pinto beans, peanuts, lean pork, yeast, liver, wheat germ, bananas, egg yolk, molasses, oats, oysters, rutabagas, turnip greens.

Vitamin C (ascorbic acid)—Hastens healing of wounds and broken bones, promotes sound teeth and bones, and has a part in the prevention of infection. Mild deficiency likely to result in a run-down feeling ("spring fever"), general weakness, and breathlessness; severe deficiency results in "pink toothbrush," sore and bleeding gums, and scurvy with its characteristic hemorrhages underneath and into the skin. Best natural sources: oranges, lemons, grapefruit, tomatoes, raw cabbage, strawberries, beet greens, green or red peppers, potatoes (raw, baked, or French-fried—not mashed), horseradish, radishes, common fruits and vegetables generally.

Vitamin D—Essential, particularly during infancy and childhood, for the development and maintenance of strong, well-shaped bones and teeth. Mild deficiency results in lack of resistance to dental caries (decay); severe deficiency causes rickets during infancy and may cause osteomalacia (bone softening and deformity) during adult life. Best natural sources: sunlight, ultra violet lamps, fish liver oil (except shark), irradiated food, fortified or irradiated milk, liver, egg yolk, butter, sardines, herring, salmon.

* * * * *

These are the big commercial vitamins. Not included in the list are vitamins E and K, and various members of the B-complex which are all described in some detail hereafter elsewhere in this report and will be found in adequate quantity in a reasonably well-chosen and balanced diet.

of yield at each step is vital in almost any chemical operation. If, for example, the yield is 60% at each of three successive steps, you start out with 100% of the original constituents, drop to 21.6% at the end of the series.

Riboflavin synthesis by one of the two big synthesizers, for example, requires eleven steps (the other one takes 15 steps) and about 200 lb. of raw materials for 1 lb. of end product—facts which give a clue to the difficulty of bringing its production up to the levels required by the bread enrichment program. Many pounds of solvents and other materials are reclaimed for further use, but 200 lb. have to be on hand to make a start.

Riboflavin Is Fluorescent

One of the basic raw materials, ribose, which is a sugar obtained by fermentation and other processing from corn sugar, gives riboflavin part of its name. (The Latin for yellow, *flavus*, tops it off. The vitamin is a yellowish powder which fluoresces brightly under ultraviolet.) Other raw materials are barbituric acid from coal tar, acetic acid from wood, vinegar, or other sources, xylol from petroleum, alcohol from grain, etc. A third synthesizer, which is getting into big production this year, hopes to make its riboflavin in ten steps, hence to have a slight edge on the two pioneers.

Riboflavin is also produced without yeast or man-directed synthesis from grain by one company's patented "biological process," i.e., by the action of friendly bacteria. The end product is not pure riboflavin, but a corn-yellow powder with 0.5 mg. pantothenic acid, 0.03 mg. thiamin, 0.025 mg. pyridoxine, and 4.5 mg. riboflavin in each gram. Since "Solvamin," as it is called, has only a faint aroma of caramels, and little flavor, it mixes well with human foods like flour, breakfast cereals, and bouillon cubes, with livestock feed, and with pharmaceuticals.

Niacin, or nicotinic acid, could be made from tobacco, and quite a bit is. But synthetic production is fast outstripping the natural product for three reasons: (1) It is the simplest of the B vitamins to synthesize; (2) there probably isn't enough tobacco in the country after smokers and agriculturists get their share of the year's crop; (3) there is plenty of coal tar for all the quinoline or pyridine needed in the synthesis. Just how the white powder is produced in several ways (one is known to start with permanganate of potash) is the closely guarded secret of several firms in the business. Competition is too intense for anyone to be telling.

Pyridoxine, or B₆, is a white powder which looks much like niacin and is synthesized after somewhat the same undisclosed manner. Paucity of production information arises not because so many are in the business, but so few. The only really big producer begs off making a disclosure.

Syntheses Are Similar

Calcium pantothenate, the commercial and nutritional form of pantothenic acid, emerges from a synthesis similar to that of riboflavin, but without acetic acid. Instead, a simple organic acid of the lactic or citric acid type is condensed with an amino acid to form beta-alanine and to replace acetic in the formula. Though the processing is similar to riboflavin, fewer steps are said to be involved.

Biotin has just been synthesized, is still in the laboratory stage and not available commercially. Natural biotin (used in the propagation of yeast) is not generally extracted, but is rather a natural constituent of certain undisclosed ingredients added to the liquid medium in which yeast organisms bud.

The remaining three members of the positively known B-complex (para-aminobenzoic acid, inositol, choline) have not yet been synthesized. The small quantities that have begun to come to market have been extracted by orthodox laboratory methods.

Vitamin C (the "antiscorbutic vitamin," now generally called ascorbic acid, sometimes marketed as cevitamic acid or C-vitamic acid, almost never under the original name of hexuronic acid) is a white, tart-tasting powder, just as water-soluble as if it were a member of the B-complex. C's nutritional job now seems to go considerably beyond its original function as the great specific against scurvy (which in a mild form continues to be a medical problem despite the apparently wide distribution of C-containing fruit and vegetable juices to all population levels; sufferers bruise too easily, gums become spongy and sore).

C is probably more potent as an anti-infective than A. With riboflavin it is considered a preventive of "pink toothbrush." It is a factor in the treatment of some forms of anemia; works with, and is apparently quite as important as, D in the development of sound tooth structure. Vague symptoms of "spring fever" at any time of year—run-down feelings, restlessness, irritability, loss of appetite, breathlessness—sometimes respond to dietary additions in natural or drugstore form. Some asthma and hay fever sufferers believe they get relief with C. (Incidentally, if you want your vitamin C intake to be at all effective as a "spring tonic," avoid daily doses of sodium bicarbonate. It neutralizes C completely, whether used as medicine or in cooking.)

Vitamin C Goes to War

Paramount use is in military diet (which with lend-lease is absorbing a lion's share of current synthetic C production and thus contributing to government limitations on civilian use) to supplement the natural C in fresh and canned fruits and vegetables, canned juices, and powdered citrus concentrates used to make a convenient battle-front lemonade. Idea behind it all is that C supplements B₁ in building and maintaining morale, assists salt in resisting heat prostration, speeds the healing of wounds and bone fractures received in action.

Though a small 4-oz. glass of orange juice contains from 25 mg. to 55 mg. of ascorbic acid (500 to 1,100 International Units) when first squeezed out of fresh fruit or poured from the newly opened can of a reputable packer (tomato juice contains about half the amount), extraction of C from citrus fruits would cost a manufacturer many times the ceiling price of \$1 an ounce (roughly 3½¢ a gram) for the identical synthetic material in large quantities. Strangely enough, it is cheaper to extract C from paprika and wild rose "hips" than from citrus fruits (gladiola leaves were even tried seriously but not very successfully for their high C content), but costs are



Before the war, Westinghouse provided vitamin A for inspectors of enameled electrical appliances and improved their ability to detect off-colors. Now, after an eye test, inspectors of army binoculars get A, if they need it.

also several times those of the complicated synthesis.

Even more strangely, corn sugar, the basic material from which the synthesis of ascorbic acid is made, contains none of it at all. First of five or six steps is its conversion into sorbitol, one of the many alcohols. Next step knocks a couple of hydrogen atoms off its structure to make it into sorbose, one of the many sugars. One of the three big C synthesizers finds it economical to start with corn sugar, the second with sorbitol, the third with sorbose.

Like some of the B synthetics, the end product comes after fermentation, oxidation, mixing with acids, alkalies, and chlorine compounds, dissolving with acetone, centrifuging, and crystallization, but not necessarily in that order. Although various substances, such as sodium, chlorine, etc., are brought into contact with the carbon, oxygen, and hydrogen of the original corn sugar during the varied process, they are subtracted before ascorbic acid finally emerges with nothing but carbon, oxygen, and hydrogen in its complex molecule.

Over a dozen more vitamins are currently occupying the attention of researchers and nutritionists, but they are as yet either so obscure in their physiological effects or so new to the laboratory that there is no present thought of commercialization. Included in the group are ten with alphabetical designations, four with tentative names: (1) vitamin B_c (the "c" is for the thousands of chicks used in experimentation)—a brand new "antianemic" factor, extracted in crystalline form from liver and said to be "half a million times more potent than fresh liver"; (2)

vitamin J—factor in guinea pig nutrition; (3) L₁ and L₂—factors in rat lactation; (4) M—a monkey requirement; (5) P (also called citrin)—a factor found in lemon juice and red peppers which has something to do with the prevention and cure of weak capillaries, hence of value in minimizing bleeding and bruising; (6) R, S, and U—all three are chick requirements; (7) W—dog and rat factor; (8) "chick anemia" factor; (9) "fish anemia" factor; (10) folic acid—a requirement for the growth of bacteria and possibly other microorganisms; (11) "grass juice" factor—required by both guinea pig and rat.

Judgment Must Be Reserved

Just because vitamins J, L, M, etc., are not yet available in the drugstore, and are thus far considered of importance only to guinea pig, rat, and monkey respectively, is no excuse for dismissing them with a shrug. What cures anemia in a chick or fish may some day relieve a widespread scourge of humankind. Much of the history of modern nutrition begins with animal experimentation in the laboratory and ends with more or less accepted additions to the human diet. Judgment must be reserved.

Current scope of research on vitamins and other food factors can only be described as gargantuan. What's more, it is being coordinated as never before by official, semi-official, and civilian agencies. University laboratories everywhere vie, and cooperate, with laboratories of big food producers, vitamin houses, and privately endowed institutions like the Wisconsin Alumni Research Foundation.

Sometimes the vitamin researchers of the far-flung official laboratories of the Dept. of Agriculture fail to see eye to eye with those of the equally official Food & Drug Administration, the Nutrition Division of the Office of Defense Health & Welfare Services, and other governmental groups. Possibly because wartime is no time for footloose dispute, but more probably because each group is represented on the Food & Nutrition Board of the National Research Council, their views have become so reconciled that the council has been able to issue its widely publicized table of "Recommended Daily Dietary Allowances" which includes both vitamins and minerals.

Corporations Cooperate

Last year The Nutrition Foundation, Inc., went into action. Founded by 18 corporations connected with the food industry, which pledged "that no founder or sustaining member . . . shall refer to his membership in his advertisement of his products or make any other commercial reference to said membership," the organization already has funds on hand to finance a research program of \$225,000 a year through 1946. Purposes among others just as public-spirited are "to develop and apply the science of nutrition . . . to improve the food and diet and thus to better the health of the people of the United States of America."

Although most of the founders and sustaining members (which range from a big agricultural implement maker through food and beverage processors to packaging manufacturers and food distributors) have well equipped laboratories, they are in effect financing research to check,

Recommended Daily Dietary Allowances*

Adopted by Food and Nutrition Board, National Research Council, in 1941

	Calories	Protein grams [1 g. = 0.035 oz.]	Cal- cium grams	Iron mg.	Vitamin A*** I. U.	Thiamin (B ₁) mg.**	Ribo- flavin [B ₂] mg.	Niacin (Nicoti- nic acid) mg.	As- corbic acid [C] mg.**	Vitamin D I. U.
Man (70 Kg.) [1 Kg. = 2.2 lb.]										
Moderately active.....	3000	70	0.8	12	5000	1.8	2.7	18	75	†††
Woman (56 Kg.)										
Moderately active.....	2500	60	0.8	12	5000	1.5	2.2	15	70	†††
Pregnancy (latter half).....	2500	85	1.5	15	6000	1.8	2.5	18	100	400 to 800
Lactation.....	3000	100	2.0	15	8000	2.3	3.0	23	150	400 to 800
Children up to 12 years:										
Under 1 year†.....	100/Kg.	3 to 4/Kg.	1.0	6	1500	0.4	0.6	4	30	400 to 800
1-3 years††.....	1200	40	1.0	7	2000	0.6	0.9	6	35	†††
4-6 years.....	1600	50	1.0	8	2500	0.8	1.2	8	50	.....
7-9 years.....	2000	60	1.0	10	3500	1.0	1.5	10	60	.....
10-12 years.....	2500	70	1.2	12	4500	1.2	1.8	12	75	.....
Children over 12 years:										
Girls, 13-15 years.....	2800	80	1.3	15	5000	1.4	2.0	14	80	†††
16-20 years.....	2400	75	1.0	15	5000	1.2	1.8	12	80	.....
Boys, 13-15 years.....	3200	85	1.4	15	5000	1.6	2.4	16	90	†††
16-20 years.....	3800	100	1.4	15	6000	2.0	3.0	20	100	.....

* Tentative goal toward which to aim in planning practical diets: can be met by a good diet of natural foods. Such a diet will also provide other minerals and vitamins, the requirements for which are less well known.

** 1 mg. [one milligram] thiamin equals 333 I. U. [International Units]: 1 mg. ascorbic acid equals 20 I. U. [1 mg. which is a thousandth part of a gram, should not be confused with one microgram, which is a millionth part of a gram. Micrograms are frequently called "gamma."]

*** Requirements may be less if provided as vitamin A, greater if provided chiefly as the provitamin carotene.

† Needs of infants increase from month to month. The amounts given are for approximately 6-8 months. The amounts of protein and calcium needed are less if derived from human milk. 100/Kg. means 100 calories to each kilogram of the infant's body weight. 3 to 4/Kg. means 3 to 4 grams of protein to each kilogram.

†† Allowances are based on needs for the middle year in each group (as 2, 5, 8, etc.) and for moderate activity.

††† Vitamin D is undoubtedly necessary for older children and adults. When

not available from sunshine, it should be provided probably up to the minimum amounts recommended for infants.

Further Recommendations, Adopted 1942:

The requirement for iodine is small, probably about 0.002 to 0.005 milligram a day for each kilogram of body weight. This amount is about 0.15 to 0.30 milligram daily for the adult. This need is easily met by the regular use of iodized salt; its use is especially important in adolescence and pregnancy.

The requirement for copper for adults is in the neighborhood of 1.0 to 2.0 milligrams a day. Infants and children require approximately 0.05 per kilogram of body weight. The requirement for copper is approximately one-tenth of that for iron.

The requirement for vitamin K is usually satisfied by any good diet. Special consideration needs to be given to newborn infants. Physicians commonly give vitamin K either to the mother before delivery or to the infant immediately after birth.

amplify, and pool their own nutritional findings. Financed by the foundation with annual grants which run from \$2,000 to \$6,000, qualified researchers in dozens of universities are seeking to discover and report the last words on wide varieties of food problems.

Projects having to do with vitamins alone total over 30, typical subjects being: minimum needs of vitamins by adult humans; effect of large quantity cooking on the vitamin and mineral content of vegetables; metabolism of vitamin A; thiamin content of frozen vegetables; conservation of vitamins and other nutritive values in dehydrated vegetables. New and valuable knowledge seems bound to result, supplementing and perhaps modifying findings of the intensive research which goes forward unabated in the laboratories of the extractors, synthesizers, processors, and distributors of vitamin products.

A and D Producers Many

No listing of companies interested in A or D production, or both, from fish liver oils can fail to include Borden, Distillation Products, General Mills (Research Products Division, formerly American Research Products), National Oil Products, S. B. Penick & Co., Scott & Bowe (remember Scott's Emulsion?), White Laboratories. Furnishing them with raw materials are Atlantic Coast Fisheries, Booth, Gordon-Pew, and smaller fleet

owners on both coasts. Also securing their oils directly from the fisheries are several big ethical pharmaceutical houses like Abbott, Parke-Davis, and Squibb.

Ergosterol is irradiated into D₂ (viosterol) with ultraviolet rays under license from the Wisconsin Foundation by Abbott, Mead Johnson, Parke-Davis, Squibb, Standard Brands, and others. General Mills gets its D₂ by "low-velocity electrons" under the Milas patent. Cholesterol is irradiated into D₃ for poultry feed by du Pont and Winthrop. (Oddly enough, Winthrop owns process patents for B₁, B₂, D₂, and D₃, markets B₁, B₂, B₆, calcium pantothenate, niacin, and C, yet chooses to manufacture D₃ only.)

Carotene (provitamin A) is produced from alfalfa by American Chlorophyll and the General Biochemical Division of S.M.A. Corp., an American Home Products subsidiary. It is produced from young cereal grasses (oats, rye, barley) by the Cerophyll Laboratories of Quaker Oats. Pure carrot oil, containing goodly quantities of carotene, is expressed by Nutritional Research Associates, Inc. The latter firm also produces wheat-germ oil and its E concentrates along with General Mills (probably the leading E producer), Lakeside Laboratories, Penick, and others. (Pure vitamin E is synthesized by both Hoffmann-La Roche and Merck.) Menadione, the chemical substitute for K, is formulated by Hoffmann-La Roche, Lederle Lab-

oratories (an American Cyanamid subsidiary), and Merck.

When yeast is mentioned for its B-complex content, your mind is likely to turn to the Fleischmann Laboratories of Standard Brands (now also getting into the vitamin tablet field). But Anheuser-Busch is the largest grower of yeast for animal feed and is becoming an ever closer second to Fleischmann on yeast for human consumption. Pabst, National Yeast, Northwestern Yeast, and others are likewise volume producers. Commercial Solvents occupies a unique position in the B field by reason of its patented bacterial method of producing large quantities of B₂ (riboflavin), plus small included quantities of pantothenic acid, and thiamin from grain. It would go into the extraction of pure riboflavin from the mixture at the drop of a hat if it could secure WPB's approval for necessary processing equipment.

Merck is the only firm that synthesizes all five of the generally used B vitamins—B₁, B₂, niacin, pyridoxine, calcium pantothenate—and has recently announced the laboratory synthesis of biotin. Hoffmann-La Roche synthesizes B₁, B₂, and niacin, plus a small laboratory production of calcium pantothenate for its own use. Pfizer synthesizes B₁ and B₂. All three manufacture large quantities of vitamin C, may be said to dominate the water-soluble (B and C) synthetic field. National Oil Products puts out calcium pantothenate. American Cyanamid is known to be looking into the bulk field pretty thoroughly, may at any time begin to expand the activity of

its Calco Chemical Division beyond the synthesis of niacinamide and calcium pantothenate.

Lederle, another Cyanamid subsidiary, added calcium pantothenate production to its menadione production some time ago, but the trade believes it will stop right there. It would hardly be good commercial logic for it to compete with its sister, Calco, in the synthesis of bulk vitamins. Its direct competition, rather, will continue to be with the other principal ethical pharmaceutical houses—Abbott, Hoffmann-La Roche (which unlike Merck and Pfizer is both synthesizer and compounder), Jamieson, Mead Johnson, Eli Lilly, Parke-Davis, Sharp & Dohme, Squibb, Stearns, Upjohn, and Winthrop.

Vitamins for Man and Beast

Further competition, without benefit of magazine or newspaper advertising directed to the public (which seems to be the mark of the only difference discernible to the layman between ethical and proprietary drug houses), is furnished by a pioneer specialist in the field of blending and distributing multivitamins—U. S. Vitamin, with a line comprising dozens of items for man and beast.

Similar vitamin specialists which have mounted the bandwagon bringing with them a flair for going directly to the public are Hi-V Vitamins (a subsidiary of Miller Laboratories, which is itself a subsidiary of American Home Products), International Vitamin (likewise an American Home Products subsidiary), and Vitamins Plus

Diet Plans That Meet the Dietary Allowances

Suggested by the Food and Nutrition Board, National Research Council

It is emphasized by the Food and Nutrition Board that "the amounts of the various nutrients provided for in its recommended daily dietary allowances (see table), with the exception of vitamin D, can be obtained through a good diet of natural foods including foods like enriched white flour and bread which have been

LIST I

Milk	.....	1 pint
Egg	.....	1 daily, if possible. (On days not used, beans, peanuts, cheese, or more milk or meat to be used instead)
Meat, fish, or fowl	.....	1 or more servings
Potato	.....	1 or more
Vegetables	.....	2 or more servings. One green or yellow
Fruits	.....	2 or more. One citrus fruit or tomato or other good source of vitamin C
Cereals and bread	.....	Whole-grain or enriched
Other foods as needed to complete the meals.		

Both lists are based on the needs of the average adult. For children the amount of milk needs to be increased, but the kinds of foods remain the same. List II uses less milk and lean meat than List I.

It should be pointed out specifically that (a) every food is needed in the amount listed, (b) if any food

improved according to the recommendations of the board. The safest way to insure that the dietary allowances are met is to include certain foods in the diet daily in specified amounts."

The board provides two lists which contain a variety of foods commonly available:

LIST II

Turnip greens	.....	1 cup
Sweet potatoes	.....	3
Peanuts	.....	20 nuts or 2 tablespoons of peanut butter
Beans or cowpeas	.....	1 $\frac{1}{2}$ oz.
Tomatoes	.....	1 cup
Corn meal	.....	3 oz.
Enriched flour	.....	3 to 4 oz
Milk (fresh, evaporated or dried)	.....	$\frac{3}{4}$ qt.
Lean pork	.....	small serving 3 to 4 times a week
Molasses, fat, etc.	.....	to complete the meals.

is omitted, it should be replaced by another of equal nutritive and nutrient value. The board expects that nutrition workers in various parts of the country will translate these allowances into appropriate quantities of foodstuffs available in their localities and suited to the income level of the group concerned.



Each capsule pictured on page 55 was filled, formed, and sealed on an almost incredible machine like the one being inspected by its inventor, Robert P. Scherer, managing partner of Gelatin Products. Two continuous ribbons of gelatin are passed through a pair of rotating die rolls. Placed be-

tween the rolls and above the ribbons is an injector wedge. From a metering pump which doles out precisely the amount of fill for each capsule, a liquid containing vitamins—or other preparations—is forced through tiny orifices at the tip of the wedge. As the rolls turn, the pressure of the

liquid bulges the gelatin into mating die pockets around the peripheries of the rolls and forms two halves for each capsule. As the die pockets meet, the halves are heat-sealed together and the capsules severed from the gelatin ribbons. The whole operation is fast, automatic, and continuous.

(now a subsidiary of Vicks Chemical) which was probably the first to team glamour, advertising, minerals, and liver extract with vitamins in a successful combination.

Were the competitive lineup to stop right there, the situation would be comparatively simple. But several of the ethical houses (originally supplying the prescription trade and still refraining from direct public sales solicitation through the papers, pulps, and slicks) found ways to promote vast nonprescription, over-the-counter vitamin sales with discreet but frequently elaborate drugstore window displays, expensive counter dispensing cabinets, direct mail to physicians, free doctors' samples, trade advertising, and so on.

Specialists Seek Greener Pastures

As vitamins passed laxatives, headache remedies, antiseptics, and "cold cures" in over-the-counter drugstore

sales (the newcomers had already become responsible for nearly a third of prescription business), sales-minded executives in more or less specialized proprietary houses like Anacin (another American Home Products subsidiary), Grove (Bromo-Quinine), Lambert (Listerine), Lan-teen ("feminine antiseptics"), Maltine, Miles (Alka-Seltzer), Norwich (Unguentine), and Plough (Penetro-nose drops) felt that their large and uninhibited public advertising experience might be cashed in by exploiting greener pastures. Into the vitamin field they came with more elaborate displays than those of the ethicals, more expensive dispensing cabinets, plus newspaper and magazine advertising, plus radio.

With them (but with considerably less promotion) came sales-minded general drug firms like McKesson & Robbins, Park, and United Drug; mail order houses like Montgomery Ward and Sears, Roebuck; big city depart-

ment stores like Macy's. First of the soap manufacturers to sell vitamins as such rather than as beauty-building components of their toiletries (now frowned on by the Food & Drug Administration since it has been pretty well proved that vitamins in therapeutic quantities are not absorbed by the skin) is Lever Bros., with an advertising campaign popularly supposed to run over \$1,000,000. Procter & Gamble, perennial no-holds-barred competitor of Lever Bros., is rumored to be coming after it into the vitamin swim.

From the drugstore, vitamin sales spread to the food chains and supermarkets like Cupples, Kroger, and Straub. (Kroger, which, on the theory that vitamins are foods, took the lead, ran into legal difficulties when Indiana's drugstores went to the state courts in an unfruitful effort to keep vitamins in the category of medicinals and thus exclusively to themselves. They won this spring, but now find a lack of machinery for enforcement.) Jewel Tea delivers vitamins from house to house in its familiar wagons and cars. Independent Grocers Alliance has its private brands for its 5,000 outlets. Grocery sales successes led the big variety chains like Green, Kresge, Kress, McLellan, Murphy, Newberry, and Woolworth into the business.

Some Sell Direct to Industry

Meanwhile, several vitamin specialty firms, notably Wm. T. Thompson Co., Vital Foods Corp., and Vitamins Industrial, went after the far-flung industrial market directly with ringing sales appeals suggesting increased production through better health, reduced absenteeism, elimination of vague symptoms of ill health by satisfying "hidden hunger." Under the stimulus of ever more intense drives for increased war production, by whatever means, their business burgeoned to a volume which caught the eyes of even the ethical pharmaceutical sales managers. Upshot is that practically every vitamin house, save only the bulk producers, is selling multivitamin capsules and tablets directly to industry.

Although drugstore operators profess to be worried at seeing grocery, variety-store, industrial, and other incursions into their traditional vitamin sales bailiwick (New York State druggists just lost out in an attempt to secure a vitamin sales monopoly through their legislature), they have as yet little cause.

Meanwhile, lest they slip from their 77.6% sales position, the drugstores are pushing newly organized drives for veterinary business—vitamins for dogs, cats, horses, poultry. (And they're not forgetting to push vitamin-fortified fountain drinks like Hemo and candy bars like Tastyeast, Vi-Cholin, and Vita-Snak.) Too new this year to give drugstore owners competitive jitters are Kent Vitamins, a 10¢ packaged seller mounted on point-of-purchase display cards for the news stands, and the Vitamin Club, supplying "a month's vitamins by mail," now being promoted somewhat after the manner of the Book-of-the-Month Club.

Strangest thing in a strange industry is the altogether unique position occupied by a potent but usually anonymous factor in vitamin manufacture—Gelatin Products Co. Any pharmaceutical compounding with reasonable

skill and modest equipment can find a way to blend vitamin with vitamin, after they are extracted or synthesized, can disperse them in liquids, compress them into tablets, fill two-part, hard gelatin capsules, and put them up in attractive packages. A few compounders have the skill and the patience to fill and seal flexible (virtually one-piece) gelatin capsules by the old and considerably more laborious "plate method."

Over Three Billion Capsules a Year

But Gelatin Products is the only concern with a method and the machinery for high-speed capsulation. Its customers consist of the principal pharmaceutical manufacturers, large drug wholesalers, veterinary concerns, mail order houses, etc., almost without exception. Its products range from soft gelatin capsules filled with vitamins, foods, medicines, cosmetics, or military prophylactics, to ones containing the liquids which are at the cores of thousands of long-flying golf balls. Annual production runs over three billion capsules of all kinds, a large majority being vitamin capsules.

Since practically every vitamin compounding requiring flexible capsulation comes to Gelatin Products (and quite a few of them have found it expedient and profitable to delegate the entire job of compounding, capsulation, packaging, and shipping), it has become one of the largest consumers of bulk vitamins in the country. Although it purchases its supplies from practically every bulk producer, it also maintains a fine-chemicals division for extracting and concentrating A, irradiating D, and synthesizing one or more of the water-soluble group. (It also manufactures hormones and other glandular and chemical substances.) Gelatin Products won't specify what besides capsules it does make or is capable of making, but one of its executives says that the fine-chemicals division "now occupies a dominating position in the manufacture of several of these substances."

Postwar and Post-Postwar

Rushed as every factor in the unintegrated vitamin industry is during a wartime seller's market, it is not to be expected that a great deal of postwar planning is being done. One executive puts his thinking this way: "We should really be more concerned about the post-postwar situation, when conquerors and conquered have been fed back to vigor and the world has been returned to its normal, if sometimes vitamin-deficient, diet. The whole job may take a lifetime and will take a lot of vitamins. A drop in vitamin demand is too far in the future to consider."

REPRINTS AVAILABLE

Copies of "Vitamins Go to War," latest in the series of periodical Business Week Reports to Executives, will be available in reprint form. Single copies of reprints will be mailed to Business Week readers upon request without charge. Additional copies will be billed at the rate of 20¢ apiece. On orders of eleven or more, quantity prices will be quoted on inquiry. Orders for reprints should be addressed to: Willard Chevalier, Publisher, Business Week, 330 West 42nd Street, New York, N. Y.

MARKETING

Retailers Survive

Checkup on mortalities by Dept. of Commerce indicates 300,000 war casualties by next Christmas, despite early fears.

As retailers reach the halfway mark in 1943, it is becoming more and more apparent that the predicted casualties in their ranks were vastly overestimated. Between Pearl Harbor and next Christmas, the net decline will have been 300,000, leaving still some 1,500,000 establishments. The total is expected to diminish but slightly thereafter.

• **Fewer Births**—Normally, retail deaths and births tend about to equal each other. Currently, deaths are continuing at approximately prewar frequency, but births are declining rapidly—hence the 300,000 net loss in two years. However, even the death rate will slacken in time, because with a near-zero birthrate, there will be fewer fly-by-nighters to add to the casualty list.

Merchandising experts fell into the error of overestimating net retail casualties because they (1) misgaged inventories, (2) figured on more rationing and standardization than we have had, and (3) didn't foresee the widespread tendency to "trade up"—that is, sell in the higher price and profit brackets. Thus, retail sales in 1943 will probably equal record-breaking 1942 in dollar-volume (though not in units of merchandise), and widespread casualties will be avoided.

• **Causes Documented**—On the other hand, a representative number of stores have succumbed to the adversities of the times. Recently, the Dept. of Commerce issued a study ("Small Retail Store Mortality") which documents the causes of disaster and the subsequent history of the defunct stores' owners and their effects. For their case histories, the Commerce researchers examined the records of 49 former automobile establishments, 55 household appliance stores, and 45 hardware outlets. All had once had at least a toehold on life (store ages ranged from 2 to 93 years). The great majority were small, having fewer than eleven employees.

Scarcity of merchandise was far and away the major factor in mortality. Loss of employees ranked second. For the rest, the operators found some "alternative opportunity"—often the opportunity to earn more money in a defense plant. Almost none of the ex-merchants damned the government for their plight. Complaints against OPA

regulations were close to zero, though a few hardware stores cussed at the complexity of WPB's priority rigmarole.

• **Merchandise Moved Easily**—In 104 of 149 cases, the shopkeepers found no trouble disposing of leftover merchandise. Sixty-seven simply continued to sell until the shelves were bare; 53 sold out to other merchants or merged with them; four held auctions; three went through bankruptcy; eleven assigned assets to creditors; and most of the others put their inventory into storage, hoping to reopen shop at the end of the war. In about half the cases, liquidation was accomplished without loss. Lack of difficulty in disposing of stocks, and the 50-50 chance of escaping loss are undoubtedly the main reasons why the retailers don't want the government to help them bail out. At least, that's what the Dept. of Commerce discovered during its interviews.

In 92 instances, merchants sold their store fixtures and equipment when they went out of business (in the rest of the cases, the fixtures were stored, junked, or re-used). Losses in this operation were frequent. Fifty cases of "heavy" losses were reported (over 50% of book value). Twenty-seven cases of "light" loss (less than 50% of book value) were noted.

• **No Trouble with Leases**—Getting out of leases seemed to be the easiest liquidation problem. In 106 cases, the merchants broke off without losses, and in only 21 cases were there financial settlements. The 17 retailers who owned their

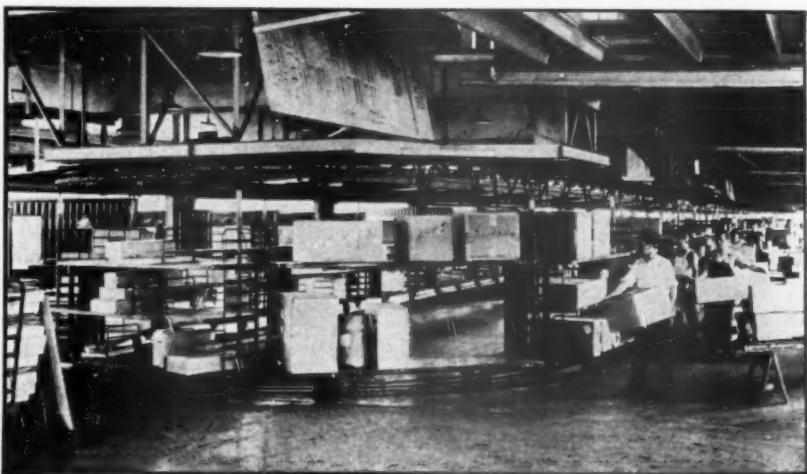
own premises reported ten cases of re-occupation by new tenants without loss.

What happened to the 149 operators when they shut up shop? Twenty-five became unemployed; 25 got jobs in war factories; nine joined the military forces; 59 took temporary jobs; 21 became permanently employed (in other than war plants); five retired; and five failed to report.

• **New Businesses Surveyed**—Just to round out its study, the Dept. of Commerce simultaneously contacted 83 stores established since March, 1942. The list included 42 food stores, 34 wearing apparel stores, and seven hardware stores. Few of the newcomers had any trouble finding premises or fixtures. They also had surprisingly little trouble finding employees—25 drafted their families (an old retail custom), and 37 others easily picked up personnel elsewhere. Most of them said they were able to get merchandise by shopping around a little.

The paradox of the newcomers' ease in locating personnel, while old-timers are folding up for lack of it, is explained by the fact that the newcomers tend to set up shop in nondefense areas. The relative ease in getting merchandise is probably due to type of store—food and apparel supplies are not as tight as automotive and general household items.

• **Entered Blindly**—On the other hand, except for the fact that the newcomers had sense enough to stay out of war centers, they went into business blindly. Although 72 of the 83 operators had prior retailing experience, the Dept. of Commerce reported: "Not even a cursory examination had been made in most cases of the extent to which new industries had come into the community, or



INDOOR RAILROAD

To move huge wartime loads through one New York sorting center, Railway Express Agency operates a novel conveyor that resembles a miniature railroad. Package trucks simulate the

cars; an endless chain moving overhead provides their locomotion. As each truck is loaded for its destination in the sorting room, it is moved away on the conveyor at 1 m.p.h. The 1,000-ft. chain helps to move 60,000,000 packages daily.

the changes which had occurred in population, general purchasing power, and buying habits. Stores soundly located appeared to have been by accident as much as by design."

At that, 51 of the 83 will probably make a go of it. Regrettably, however, that won't help the war effort much. The department estimates that 48 of the 83 aren't necessary to replace former stores, or increase the source of supply in mushrooming areas.

Billboards Tallyed

Traffic Audit Bureau to intensify check on readership of advertising panels now that the consumer is back on his feet.

War's drastic reduction in automobile travel and its general upheaval of local traffic conditions, particularly in heavily populated industrial centers, undoubtedly is creating a backlash in outdoor advertising's "circulation." Persons who formerly motored now walk or ride public conveyances; many back streets are now main drags, or vice versa, because of employment shifts.

• **Readership in Traffic**—To the outdoor industry in general and to advertisers in particular, these effects are important since traffic means potential readership in much the same ratio as subscription figures are important to the publishing trade. Having taken a beating when several key advertisers—notably automotive and oil interests—slashed their billboard campaigns, the industry developed a case of war nerves. Faithful advertisers, meanwhile, worried and wondered about the attention they were getting.

Apparently first to crack under the suspense, advertisers took their fears to the Traffic Audit Bureau, which has kept tab on outdoor readership (BW—Mar. 2'40, p25) for ten years by auditing traffic counts made at principal signboard locations. As a result, the bureau will issue next month its first semiannual compilation of counts for the nation's 412 districts of 25,000 or more population.

• **Audit Took Three Years**—The semiannual checkup differs from previous audits in several respects. Previously, the bureau each year audited only one-third of the signboard locations maintained by the 1,200 outdoor advertising services (plants) belonging to the Outdoor Advertising Assn. Since the association represents 90% of all standard (24-sheet) outdoor promotion facilities, T.A.B. thus took the pulse of nationwide "circulation." But a full compilation was available only at three-year intervals—too seldom to reflect sudden or locally peculiar changes.

Under the new setup, each plant op-

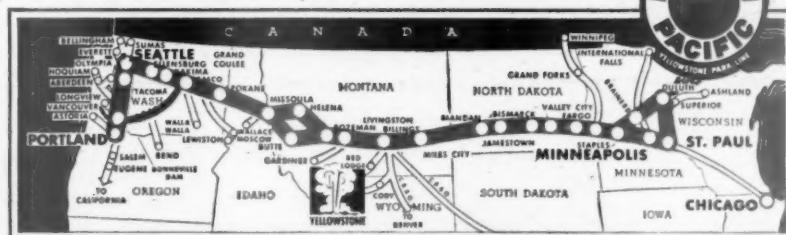
"Nursemaid" to pampered steers . . .



helps move enough beef . . .



to feed 1,058,924 soldiers . . .



via the Main Street of the Northwest!

When it's time to move beef cattle from the grassy ranges of the Northwest to feed lots and markets, cowboys like Frank Waldhauser (top picture) ride right along with the steers in special Northern Pacific cattle trains. Last year these cowboys helped move more than 15,000 carloads of cattle over the Northern Pacific Rail-

way from Minnesota, North Dakota, Montana, Idaho, Oregon and Washington—enough beef to feed 1,058,924 soldiers for a whole year!

This year, as army, navy, lend-lease and civilian needs become greater, still more fine beef is rolling to market over Northern Pacific—Main Street of the Northwest!

NORTHERN PACIFIC

MAIN STREET OF THE NORTHWEST

**VICTORY RIDES
THE RAILS**

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... Congratulations to the Railroads of America

Over the shining network of rails that span America, millions of fighting men are speeding toward victory—with tanks, trucks, big guns—ammunition—supplies—food! The greatest military, freight and civilian railroad traffic in history! International has good reason to pay high tribute to the railroads. They are moving millions of tons of the products mined and manufactured by International for vital military, industrial and agricultural

purposes. *Phosphate rock and potash*, essential ingredients in fertilizer manufacture. *Complete fertilizers* with which our farmers, with less labor, are growing larger crops than ever before. *Magnesium*, the new light metal used in airplanes and bombs. *Chemicals* for many urgent war-time needs. Yes, Victory rides the rails. Keep 'em rolling! *International Minerals & Chemical Corporation*, General Offices: 20 North Wacker Drive, Chicago.

International **MINERALS AND CHEMICALS**

Mining and Manufacturing

PHOSPHATE • POTASH • FERTILIZER • CHEMICALS

ator in the larger areas will make a count of pedestrian, automobile, bus, and trolley traffic at representative sites in his district. The counts will be made during March, April, and May; again in September, October, and November. Methods for making them were developed by the T.A.B. in conjunction with its three joint sponsors: the Assn. of National Advertisers, the American Assn. of Advertising Agencies, and the Outdoor Advertising Assn.

How It's Done—Procedure for making the short counts is similar to that used in the bureau's regular three-year tests. One-half the pedestrians and motorists and one-quarter of the trolley riders passing a given "stand" are multiplied by a predetermined factor to achieve the gross figure. The multiplier covers such factors as the position of signboard panels in relation to traffic, the number of hours it is visible daily, the speed of traffic, and the length of traffic's approach. The answer is net "circulation."

To help finance the reports, each outdoor association member is assessed 50¢ a panel for the number of panels in a "100 showing" campaign in each of the counted towns of his district.

Trend Reversing

Opening and closing hours of retail stores no longer are keyed to free time of war-plant workers; labor is deciding factor.

This time last year department stores and specialty shops were stumbling over each other in an effort to make their opening and closing hours correspond to the shopping time of war workers on erratic schedules. Even stores in cities located outside critical work production areas—New York and Boston, for example—took to staying open one night a week (BW—Jul. 4 '42, p67).

• Extra Hours Don't Pay—Now the trend is in process of reversal. High-priced specialty shops, particularly, have found that the extra hours don't bring in their quota of extra customers. Department stores which play up furniture, heavy appliances, and such find it good business to give the whole family a chance to shop together.

But for all stores, labor has become

the deciding factor, and employees generally don't like working nights. With the labor market as tight as it is now, they can have their way about it. Even in Norfolk, Va., the dissatisfaction of retailers and their employees with a Thursday night opening has finally prevailed over the Army and Navy's desire to give swing-shift war workers extra shopping time (BW—Jun. 6 '42, p22).

• WMC Sets the Rules—There is now no country-wide pattern for stores' opening and closing hours. In some critical areas, the War Manpower Commission is stepping in and saying when retailers can and can't operate. In most cities, WMC is chiefly concerned with cutting down absenteeism by providing extra shopping time for war workers.

Thus, in Dayton, WMC insisted (over vociferous protests) that stores stay open two nights a week. Retailers finally figured out a system whereby employees are compensated for the time they work nights by a noon opening four days a week and a total work week of 41½ instead of 45½ hours.

• Three Choices—On the West Coast, WMC's prime objective has been to get labor out of the stores and into the fields



BEN DIX FOR BENDIX

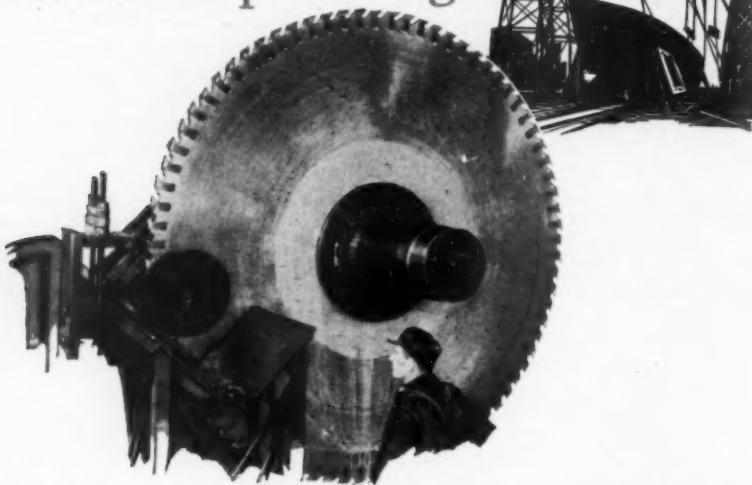
On July 25, a new swashbuckling adventure character bows into the Sunday comic supplements—in advertisements slated for 16 papers through-

out the country. He is Capt. Ben Dix, an imaginary Marine flier who blasts the Japanese and plugs Bendix Aviation products on all fronts—and in four colors. Claimed to be the first attempt to educate airminded youth

via the funnies, the campaign is aimed at potential postwar aircraft markets. Each strip in the 13 biweekly insertions will end with a technical aviation essay and the offer of a scrapbook in which to paste the "lessons."

The world's largest saw...

by *Disston* ... speeds
wartime shipbuilding



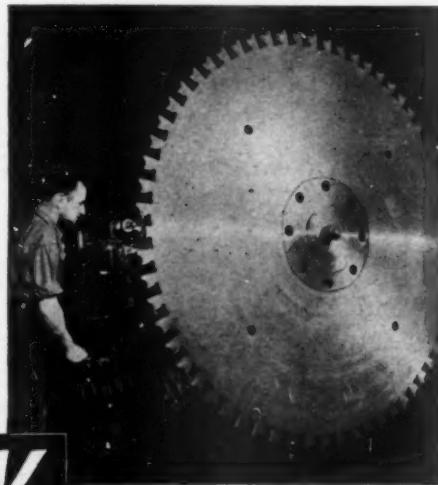
A plant building locomotives, combat tanks and important marine equipment uses this immense saw to slice through large thrust-shafts, crankshafts and connecting rods. This Disston saw is 120 inches in diameter—weighs 2,200 lbs.—and its teeth of fine Disston Steel cut tough alloy steel shafts with the greatest of ease!

No other manufacturer has ever made an inserted tooth metal cutting saw in this giant size. It's another Disston outstanding achievement—the kind of successful toolmaking that means to you, *extra* quality and *plus* performance in every standard Disston tool you buy.

Disston wood and metal cutting saws, files, hack saw blades, tool bits, machine knives and other tools are on 'round-the-clock duty everywhere on American wartime production lines . . . And to keep *all* makes and types of tools working better and longer, Disston will supply any manufacturer with FREE Conservation Control instruction cards—covering 34 different types of cutting tools.

Quality tools and practical working help will conserve man-minutes and speed the day of Victory. For any information on Disston products or free cards write Henry Disston & Sons, Inc., 72^o Tacony, Phila. 35, Pa., U.S.A.

Experienced toolmaking and fine craftsmanship at Disston made this saw possible . . . Some of the other Disston precision products made for war service include Meat, Bacon and Bread Machine Slicing Knives for the armed forces; Powder Knives for the manufacture of explosives; Clutch Plates for airplane superchargers, and Carbolyt-tipped Cutters for milling the fins on airplane cylinder heads



DISSTON

Conserve man-minutes and help win the war



and factories. In Seattle, the WMC gave department stores three choices. They could institute a 48-hour week for all employees, submit figures showing that employment in any week did not exceed 75% of the lowest week in 1942 (no exceptions for Christmas and other peak selling periods), or stay open only five days a week, leaving employees two full days for war work.

Of the three, stores prefer the five-day week, though they complain that it will cut volume, send customers to small, suburban shops that are not similarly restricted.

• **Authority Doubted, But**—Generally, retailers are much opposed to the 48-hour week for salespeople, though they are willing to accept it for non-selling employees. Their argument is that no benefits derive from having a flock of salespeople in the stores during slow selling hours.

Retailers argue that WMC has no legal authority over their doings. But they admit that the commission has the power (by straining all hiring through the U. S. Employment Service, refusing stores even replacement labor) to compel them to toe the line.

• **NWLB Has Its Say**—Another government agency, the National War Labor Board, also has been mixing in retailers' affairs. Where stores have attempted to hold employees by cutting work hours, local NWLB offices have held that this is tantamount to a wage increase and ruled against it. Present policy is that stores may not close for an extra evening, or half-day, without getting a clearance from the board.

In noncritical areas, retailers are tending to substitute later opening and closing hours every day for one big open night. Most store managers would like to see a 10 a. m. opening and 6 p. m. closing become the rule, instead of the 9:30 to 5:30 hours which have been customary. This would give extra shopping time when it's needed—at the end of the day—and help do away with the hush that prevails in the stores during the early morning hours.

• **Employees Kick**—Employees aren't so enthusiastic about the later hours—though they will sometimes accept them as the alternative to night openings. In Philadelphia, where the 10 a. m.-6 p. m. schedule was adopted as a means of spreading out the transportation load, stores recently got permission from the city's transit director to go back to the old hours during the summer as a concession to employees (BW-May 22 '43, p 92).

In some areas, the labor market is squeezed so dry that stores can't even get enough extra help to give regular employees summer vacations. Thus in Portland, Ore., some small stores are just closing down for a week or two, giving the whole staff a vacation at once.

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Would you trust this man?

(Case No. 199,267 from U. S. F. & G. files)

A southern real estate company trusted him. And why not? He was secretary of the concern . . . employed for over 15 years . . . enjoyed an irreproachable reputation . . . was married and had several children. Yet he embezzled nearly \$30,000! Fortunately he was bonded through U. S. F. & G., so his company was spared financial loss.

Appearance, reputation, background provide no absolute clue to character. The only sure protection against embezzlement losses lies in insurance, and when an insurance company is willing to write fidelity bonds covering your employees that is a tribute to their honesty and integrity. If your company has not reviewed its bonding program in the light of today's employment problems, we suggest that you do so at once.

Illustrated on this page are other cases, showing some of the hazards that demand insurance protection as a safeguard against financial loss. Your local U. S. F. & G. agent will be glad to make an audit of your present insurance program to help guard against wartime risks. He is one of thousands serving communities great and small throughout the United States, its possessions, and Canada. Consult him today.

U. S. F. & G.

UNITED STATES FIDELITY & GUARANTY CO.
affiliate:

FIDELITY & GUARANTY FIRE CORPORATION

HOME OFFICES: BALTIMORE, MD.
BRANCH OFFICES IN 43 CITIES



Consult your insurance agent or broker as you would your doctor or lawyer

(Case No. 1-B-3524)

Robber makes off with payroll

It was an unhappy payday for the employees of the dress manufacturing concern when the robber held up the bookkeeper and made off with the \$2,140.49 payroll. But thanks to payroll insurance, the concern suffered no loss and the employees received their pay. Crime usually increases during a war. Are you protected against such losses?



(Case No. 21-G-1326)

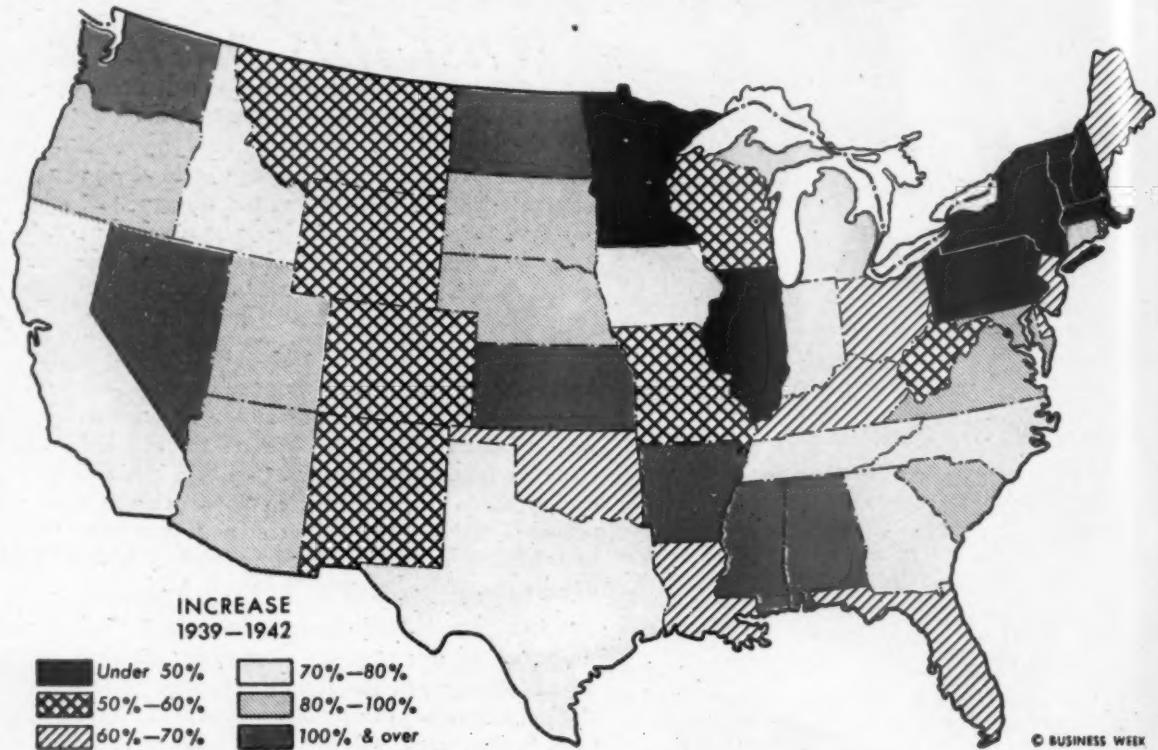
Tire spins stone through window

One moment the proprietor of the Pennsylvania store was sitting peacefully in his shop . . . and the next, his display window was shattered to bits. The cause: a stone kicked up by a passing car. The cure: plate glass insurance with U. S. F. & G. who replaced the window and saved the shopkeeper loss. Are your windows, glass doors, or display cases similarly protected?



WAR REARRANGES STATE INCOME PAYMENTS

Percentage gains between 1939 and 1942 vary sharply across the nation



© BUSINESS WEEK

Income sources—farm, military, industrial—change significantly

(Figures in millions of dollars)

	Manufacturing and Construction Payrolls				Farm Operators' Net Income				Manufacturing and Construction Payrolls				Farm Operators' Net Income				
	1939	1942	1939	1942	1939	1942	1939	1942	1939	1942	1939	1942	1939	1942	1939	1942	
	U. S.	14,739	34,667	6,144	11,889	4,113	9,804	45,605	57,579	Mont.	26	37	35	47	38	122	189	244
Ala.	136	463	64	202	99	190	383	574	Neb.	49	103	58	88	73	299	345	475
Ariz.	16	51	31	84	16	50	164	232	Nev.	5	56	11	21	4	10	64	94
Ark.	43	244	41	106	121	286	272	399	N. H.	74	128	27	29	7	7	160	180
Calif.	710	2,504	469	1,039	179	453	3,689	4,739	N. J.	831	2,004	224	392	32	48	1,771	2,087
Colo.	60	148	64	122	39	105	401	503	N. M.	9	17	25	57	26	50	119	156
Conn.	415	1,207	81	108	19	22	786	971	N. Y.	2,127	4,161	893	1,265	105	182	8,175	9,860
Del.	37	118	13	22	11	22	142	170	N. C.	274	523	92	225	190	413	534	715
D. C.	47	72	310	660	...	...	456	579	N. D.	8	25	28	47	224	129	165	165
Fla.	81	189	72	300	53	104	612	770	Ohio	1,240	2,843	292	453	162	360	2,459	3,019
Ga.	167	346	77	317	117	200	541	751	Oklahoma	71	197	80	168	106	272	540	695
Idaho	21	54	24	37	35	89	133	185	Ore.	118	400	57	117	42	110	369	501
Ill.	1,290	2,557	375	556	228	511	3,392	4,284	Pa.	1,432	3,161	413	679	105	163	3,870	4,691
Ind.	519	1,192	125	185	132	335	913	1,191	R. I.	156	336	39	68	3	2	282	336
Iowa	142	278	96	117	304	786	643	842	S. C.	116	236	48	200	82	149	246	333
Kan.	70	291	79	128	83	361	461	649	S. D.	12	21	27	42	53	201	135	164
Ky.	110	202	74	163	122	244	534	735	Tenn.	168	377	80	155	104	232	500	691
La.	112	270	82	250	88	144	547	707	Tex.	276	867	221	666	303	698	1,755	2,323
Me.	97	246	32	77	19	38	252	303	Utah	26	98	28	100	23	46	167	241
Md.	237	739	91	209	25	52	722	953	Vt.	34	69	16	19	15	24	109	129
Mass.	769	1,558	262	483	22	31	2,055	2,410	Va.	184	485	117	375	81	168	614	841
Mich.	1,111	2,750	247	359	109	244	1,587	2,008	Wash.	201	683	116	306	50	143	645	1,028
Miss.	187	383	127	154	175	466	889	1,031	W. Va.	134	272	53	73	39	53	487	717
Miss.	50	132	45	168	126	315	215	300	Wis.	405	857	134	167	124	334	852	1,055
Mo.	327	723	136	271	155	387	1,213	1,539	Wyo.	10	13	19	36	23	55	89	118

Concentration of pinkish-reddish coloration in three areas on the map points up the three types of income payments which have fluctuated most during the war, and which are chiefly responsible for the wide differences in income gains among the states.

Careful scrutiny of the table on income sources reveals that the relative income gains of the Far West are primarily due to an expansion in manufacturing payrolls, those of the agricultural Midwest to a jump in farm operators' net income, and those of

the southern states (with climates favorable to the location of military camps) to the sharp increase in government payrolls. The strongly varied changes resulting from the war also have basic postwar economic and marketing significance (page 124).

They don't look like killers, do they?



To the untrained eye they look a lot more like big rough-cut diamonds than slick smooth killers. But killing is strictly their business.

For these two pieces of glass are destined to fit into U. S. gunsights or some other type of fire control apparatus, to guide quick and certain death to our enemies.

There was one trick in the making of these that Corning has been able to do better than anybody else. And that's a most important trick — to devise a way to mass-produce them, so the government can have all it needs when it needs them.

As many industries have learned, it isn't easy to turn technical handsprings on short notice for a country at war. To do so requires years of background, years during

which money and time have been spent with a generous hand on research and development reaching beyond the immediate need of the hour.

The glass industry has been far-sighted in this respect. It was ready for war. And Corning, as a leader in research, was ready with many of the swift developments in glass that war called for.

For instance there were Corning glass pipe lines and glass acid pumps to replace vital alloys in the chemical and food products fields. There were years of experience and know-how at Corning in the making of glass for radio, x-ray, and lamp bulbs —extremely valuable for a country that needed these in vast quantities together with adaptations for use in such jeal-

ously guarded secrets as submarine locators.

These are just a few of the ways in which glass and Corning research in glass are aiding the war effort. Perhaps glass can help in your plant with your war orders, by replacing metals or speeding output. If you think so, write Corning Glass Works, Corning, N. Y.

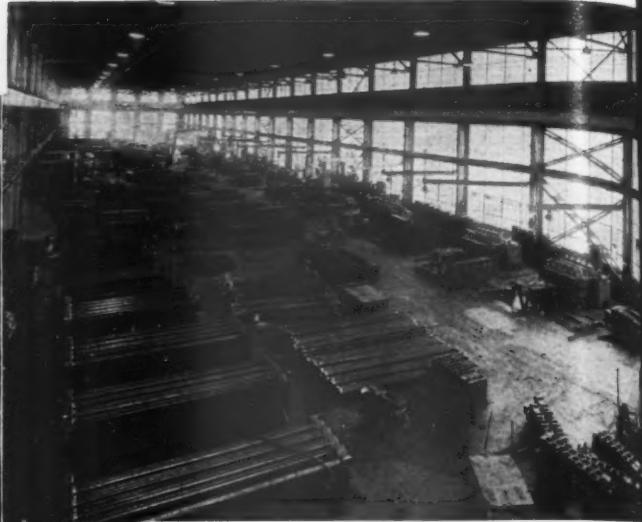
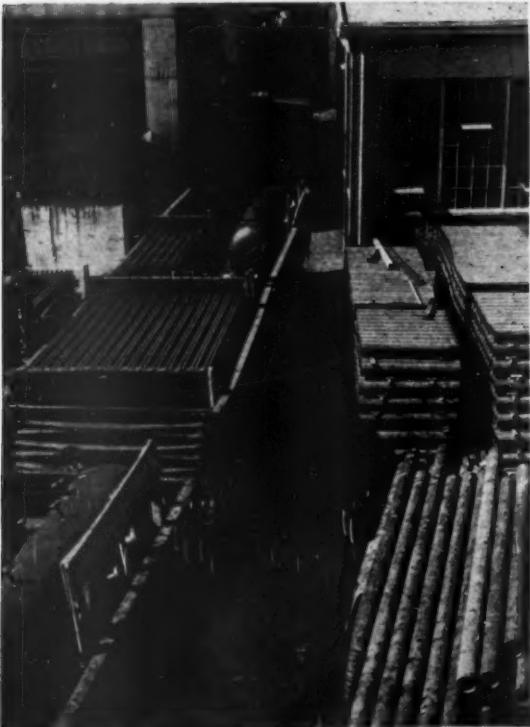
CORNING
means
Research in Glass

FROM SHOP TO SEA

1 Boiler drums . . . roll off a production line in continuous procession.



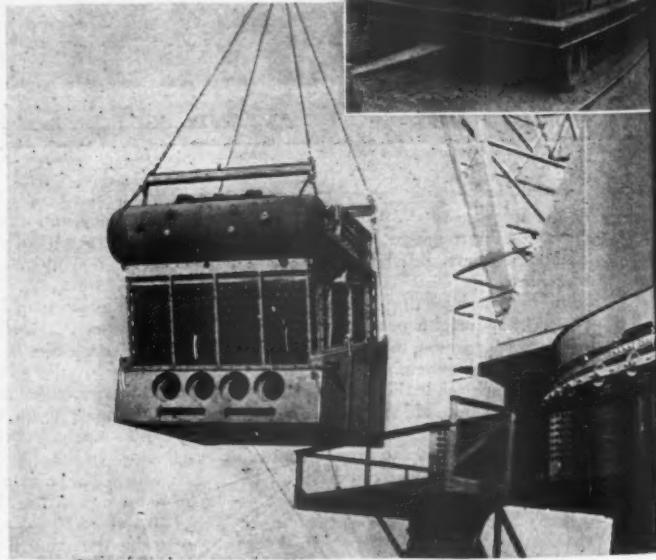
3 On their way . . . a string of railroad cars start the boilers toward some busy shipyard.



2 Sinuous headers . . . as formed in the C-E H Forge Mill, are machined and sections are added to balance boiler drum production.

4 Roll it away . . . the assembled boiler is moved to the shipway.

5 Lower away . . . the boiler is lowered into the ship.

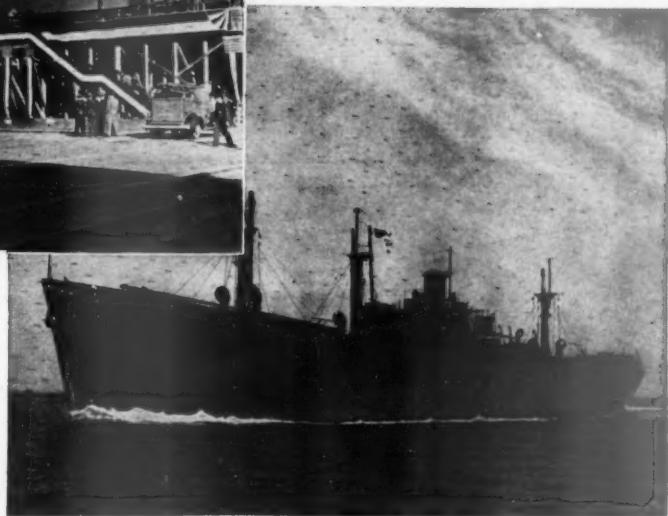


A STEADY FLOW OF *C-E* BOILERS for U. S. Maritime Commission Ships

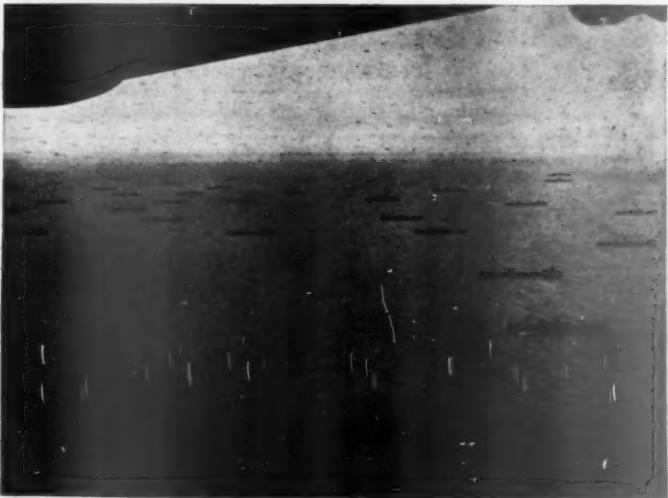


6 Launching day . . . the ship is ready for christening.

7 Full steam ahead . . . the boilers pass their tests on the trial trip and the ship is ready for service.



8 Destination unknown . . . the ship joins her convoy.



This pictorial report covers the high spots of the journey from shop to sea followed by hundreds of marine boilers being built today by Combustion Engineering. They are leaving C-E shops at a speed which, judged by pre-war practice in boiler manufacture, achieves the impossible. This rate of output is the result of multiple production methods especially developed for the present emergency in order to keep pace with the unprecedented shipbuilding program of the U. S. Maritime Commission.



C-E installations span the whole range of steam generating requirements from small stoker-fired boilers of less than 50 horsepower to the largest power station units.



COMBUSTION ENGINEERING

200 MADISON AVENUE • NEW YORK, N.Y.

Official U.S. Navy photograph

A-730

Packaging Pinch

Cosmetic manufacturers now have trouble getting glass, and even if this were in supply, what would they do for lids?

After licking its wartime raw material problems to set production and sales records, the cosmetic industry is now faced with a container and closure crisis that might become the limiting factor on its output for the duration.

Made of nonstrategic raw materials, glass has become the refuge container for thousands of products. The drain has become particularly heavy with the shift of many foods from tin and other metal containers to glass.

• **Use of Glass Limited**—As a result, a WPB order will cut the number of glass containers that the cosmetic industry can use for the next four months to 65% of the number used during the corresponding period of last year. Although WPB men describe the order as temporary, it is doubtful that the quota restriction will later be lifted. More favorable quotas, however, may be assigned during the winter months when food packing is at a seasonal low.

Next major container material used by the industry is paper. Threatened with a WPB paper simplification and standardization order several months ago, the WPB Cosmetic Industry Advisory Committee worked out a voluntary simplification program under the auspices of the National Bureau of Standards which finally went into effect the first of this month.

• **Formal Cut Impends**—While cutting down on the amount of paper used in each container, this program does not limit the number of units used by each company. However, pending WPB allocations of wood pulp on the basis of end product essentiality may cut down the number of paper units available to the industry.

Metal containers, primarily used for lipsticks, compacts, etc., were denied to the cosmetic industry early in the war program. Most of these products switched into plastics which, under current WPB allocations, have been banned for cosmetic containers. Supplies of wood and other containers for such products are very limited.

• **Closure Problem**—Even while glass containers were available in unlimited quantities, the industry found it difficult to obtain sufficient closures. Like metal containers, metal for cosmetic closures was banned early in the war program. Plastics for cosmetic closures, available until recent months, now have been cut almost to nothing.

The industry could use wood and paper closures, but production capacity

A Pledge from AMPCO Employees

The Men and Women of Ampco Metal, Inc. feel honored in having received the Army-Navy "E" We take this to mean that we have not failed to keep the faith with the men in uniform.

Since nothing has been done that cannot be done better, we pledge that in the months to come, our minds, hearts and muscles will be devoted to the production of still more of the finest materials. Certainly our very best is the very least our fighting men deserve. We will back them every step of the way to final VICTORY!

Duke Ruppenthal
President

EMPLOYEES MUTUAL BENEFIT ASSOCIATION
OF AMPCO-METAL, INC.

AMPCO METAL, INC., MILWAUKEE, WISCONSIN

AMPCO
METAL

THE METAL WITHOUT AN EQUAL



TRUSTING THE CUSTOMERS

In most restaurants, customers seldom get within reaching distance of the cash drawer. At Seattle, Wash., however, A. R. Morrowich runs his lunch room differently. He not only allows patrons to ring up and deposit the amounts of their checks, but also permits them to make their own change. So far all diners have been honest, reports Morrowich.

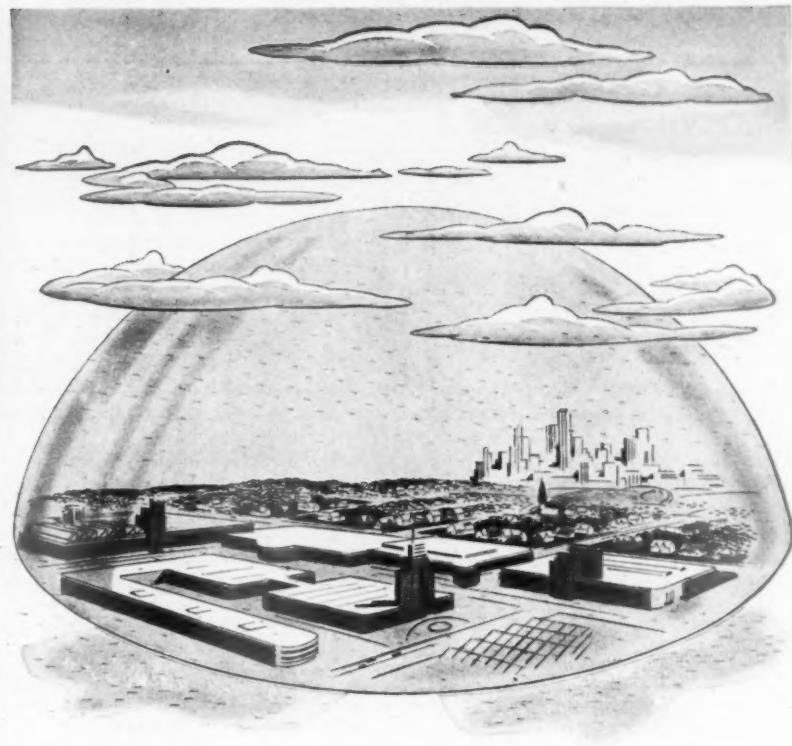
in these materials can handle only a fraction of the industry's total needs. • Ceramics May Be Had—Sizable production capacity is available in the ceramics industry, and a number of cosmetic companies are turning to such closures. While these are satisfactory, both industries realize that this is a war baby because the cost involved is higher than the cosmetic people normally have to pay.

NATIVE PIPE WOOD

News for smokers is the use of California manzanita for making pipes. Woodbridge Metcalf, forester of the University of California, believes the wood may become an important factor in the pipe field, and owners of sprouting manzanita stands in the coast ranges of the state and in southern California are becoming interested in the sale of wood usable for pipe-making.

"The best burls for pipes are those which have grown to merchantable size in areas where no fires have occurred," Prof. Metcalf finds. Manzanita and the Mediterranean brierwood belong to the same family. In appearance, the wood of the manzanita burl is much like brier burl; it also has the desirable flame pattern.

Two mills already have been established in California to cut manzanita grown in Santa Cruz and Monterey counties. Pipe blocks, which, a few weeks ago, sold for 2¢, have gone up to 6¢.



This is an AIR CASTLE—as we see it

It is built to win a war. In it, men and machines can work faster and longer. They make better weapons—and more of them—to closer limits, with less spoilage. Today, our air castle is an arsenal.

Let's see what it may be after Victory.

In this air castle, people live longer, are sick less often. Your new kind of car or plane or boat is better designed, cheaper to run, and lasts longer. It's easier to keep house. And easier to keep up factories.

In a thousand ways, life is finer, because this is a *clean-air* castle—where germ-bearing dirt and destructive dusts, flammable and noxious particles, even sparks, are trapped or arrested.

The job of Air-Maze is to bring your clean-air castles down to earth. To engineer our proved principle of air filtration to your new ideas. With a record of over 3,000 successful filter designs and a hard-earned reputation for pioneering, Air-Maze is a good place to start when you want the right air filter for any equipment—quick.

AIR-MAZE FILTER PANEL



High Efficiency • Low Restriction
Cleanable
ONE OF OVER 3,000 TYPES

AIR-MAZE CORPORATION • CLEVELAND, OHIO

AIR-MAZE
SPECIALISTS IN AIR FILTRATION

PRODUCTION

Cooling by Gas

Servel has tested new gas air conditioner with an eye to postwar market, and now it is preparing sales setup.

While some companies are only "studying" the postwar problem of resumed consumer production and maintenance of jobs, others are sweating over specific items which will be ready for a starved market soon after the fighting ends. Among the latter is Servel, Inc., Evansville, Ind., which made refrigerators that operated on gas or kerosene flame before it turned to war work.

• **Hot or Cold**—Servel's candidate in the postwar sweepstakes is an air conditioner for homes or commercial buildings which runs on gas. It provides, through a single unit, heat for winter, cooled air for summer, ventilation for all seasons. The development carries one step farther the paradox of cooling by means of heat. Also it opens new vistas for speculation since it is evident that fuels other than gas can perform the same task.

Extensive use-tests have proved the practicality of the conditioner, and Servel officials are now in the midst of a campaign to ready their sales setup. Servel refrigerators are distributed largely through gas utilities. Officials of the company are now traveling the country, holding meetings and inoculating gas company executives with the details. Although no deliveries can be made until peace returns, the conditioner thereafter is expected to become an important factor in increasing sales of gas, both natural and manufactured.

• **Ruthenburg's Interest**—Louis Ruthenburg, Servel president, is in direct charge of the drive to enlist the cooperation of utilities. His interest in postwar development extends beyond his own company since he is president of the Indiana State Chamber of Commerce and is Indiana Regional Chairman for the Committee of Economic Development.

At a conference in New York last month, Ruthenburg introduced the air conditioner as "a tangible project through which the gas utilities of America now can help to bring about substantially increased employment and productivity immediately after wartime restrictions are alleviated."

• **Preview in 1939**—Servel has been working on the air conditioner for eight years (BW—Aug. 2 '41, p. 40). One of the wonders at New York's World's Fair was a house cooled with heat via the Servel conditioner. Engineers at that

time admitted the validity of the idea but believed the cost problem would be hard to lick. While Servel's switch to war work interfered with the development, the War Production Board realized the importance of the project to peacetime industry and gave a limited O.K. to the use of materials in field tests and installations.

Before the war, Servel had 300 experimental units put into use through cooperation with 27 utility companies. Some of these have been under test for four years. All climates were included in the trials.

• **Tests Were Varied**—Usually the compactly packaged unit was placed in the basement as is the case with a conventional heater. But attic and ground floor installations in the scorching climates of Louisiana and Texas proved the flexibility of use. Trials also were made in single offices, large restaurants, and other commercial spots. Extensive tests were conducted in the moderate climate of the Atlantic Coast where much of the future demand is expected.

The experiments have backed Servel's claim that its all-year air conditioner is free from trouble since the design is simple and almost innocent of moving parts (a fan is used to force air circulation through ducts). Reports show quiet, economical, and trouble-free operation.

• **Figures on Cost**—Installation cost for a home in New Jersey was \$1,700 in a test conducted in cooperation with the Public Service Electric & Gas Co. The

cost for cooling during the June-September period last year was reported as averaging a little over 13¢ per running hour and roughly \$1 per day. Costs are much lower in areas where natural gas is available.

Absorption type of cooling equipment is used. This does away with the compression pump and other moving parts necessary in electric refrigerators. The absorption refrigeration method requires direct application of heat, thereby employing expansion instead of pumps to increase the pressure of the gas to a point where liquification may occur in the condenser. The cooling results from expansion of the vapor, after which it is transferred to cooling coils. The Servel refrigerator uses a direct gas flame for this heating operation; the air conditioner uses steam from a boiler which is heated by gas.

• **Coils Heated in Winter**—In winter, steam from the boiler heats coils which are part of the packaged equipment. A fan blows hot air in winter and cold air in summer through ducts leading to all parts of the house. The operation is real conditioning since it not only cools and heats as the season requires, but also supplies moisture to the hot air in winter and removes it in summer.

HOME DEHYDRATOR PLANS

Ten types of home dehydrators for conserving fruits and vegetables have been approved so far by WPB's Office of Production Research & Development and now await issuance of an order allocating materials.

To date the firms that can go ahead on manufacturing plans include: Gen-

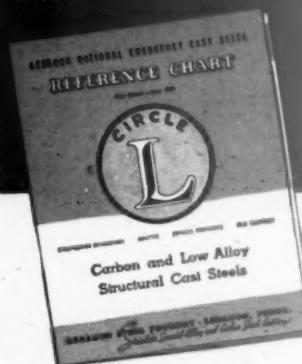


HARVEST HELPMATE

Experimental one-man hay balers have sprinkled the past, but rarely have they matured into commercial ventures. But now Allis-Chalmers announces that its one-man baler had completed field trials, and was ready for market—"as soon as machine tools

and materials are again available." Operated by a power take-off from a tractor, the baler packs the hay into 3-ft. rolls. Binder twine is used instead of wire. Weighing 1½ tons and mounted on rubber tires, the machine has a capacity equal to compression-type balers with three- and four-man crews, the company reports.

Emergency Steels You Can Trust In ANY Emergency!



CIRCLE ① National Emergency Cast Steels are "emergency" materials not only in the sense that they save critical alloys—they also possess the quality and integrity to meet the severest tests of operation. All have been approved for production only after measuring up to critical standards based upon the functions each steel is intended to perform.

Lebanon foundry engineers and

metallurgists . . . who have had close contact with war production requirements since the beginning . . . will gladly advise you which of these steels fits your requirements. Design, thickness of section, required hardness and shock resistance are always thoroughly studied. The consultation services of these foundry engineers and metallurgists are available upon request to interested organizations.

SEND FOR FREE COPY OF HANDY "MINUTE REFERENCE"

No fumbling...no groping for information! Simply open this *file-size* Lebanon reference chart and the essential facts about Circle ① National Emergency Cast Steels lie before you—on a single spread. Shows comparative specification designations, nominal analyses, minimum physical properties and heat treatment. The complete chart is available to executives, engineers and metallurgists. Write for your copy.



LEBANON STEEL FOUNDRY, LEBANON, PA.

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

CARBON STEELS

Lebanon Designation	U. S. Navy Designation	Federal Designation	Emergency ASTM Designation	Similar AISI Type No.	Similar SAE Designation	Similar NE Designation	Nominal Analysis					
							C	Si	Mn	Ni	Cr	Mo
① B	49-S-1 (INT) Grade B, C, Cw, D	QQ-S-681b Grade X, 0, 1, 2	EA-A-27-42 Grade B-2	1025	1025		.25	.40	.65			
			EA-A-215-41 Grade EA-2V EB-W EN-2W									
			EA-A-27-42									
① A	49-S-1 (INT) Grade A	QQ-S-681b Grade 3	A-27-39 Grade H	1040	1040		.40	.40	.75	†	†	†
① C				1040	1040		.40	.40	.75	†	†	†
① D				1040	1040		.40	.40	.75	†	†	†

*NE ALLOY STEELS

① 205 (A)	49-S-1 (INT) Grade F	QQ-S-681b Grade 4A-2	EA-A-148-42 Grade A-2			NE8630	.30	.40	.80	.60	.60	.20
① 205 (B)		Grade 4C-2	Grade C-4			NE8630	.30	.40	.80	.60	.60	.20
① 205 (C)		Grade 4C-3	Grade C-2			NE8630	.30	.40	.80	.60	.60	.20
① 205 (D)		Grade 4C-4	Grade C-3			NE8630	.30	.40	.80	.60	.60	.20

† Residual alloys contained.

* Supplied with approval of W.P.B.

NOTE: Other ① standard grades of alloy steel castings available with proper priority and W.P.B. approval.

LEBANON Stainless and Special Alloy STEEL CASTINGS



Ready to Work Shoulder to Shoulder With Your Organization...
WITHOUT LOST EFFORT on SUB-CONTRACTS



Management Engineers Trained Workers

* As a source for Sub-Contract work to supplement your own war production you'll find Craft offers you all the advantages you are looking for: Specialized experience and trained craftsmen... an engineering department that's expertly manned... a modern plant and streamlined facilities.

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No matter what your fencing problem—it pays to get the benefit of Anchor's 51 years' experience on every type of industrial fence, barrier, and enclosure: chain link, barbed wire, woven wood, board, other special constructions. Anchor's 16 branch offices provide speedy nation-wide service. Write for Free Industrial Fence Catalog and name of nearest Anchor Fence Engineer. You may be surprised to learn how Anchor's experience can save you headaches, time, money!

Anchor Post Fence Co.

6670 Eastern Avenue
 BALTIMORE-24, MARYLAND



Although WPB has loosened up on output of civilian buses, there is pressing need for new equipment now. The War Dept., to ease transportation jams in the congested Pittsburgh area, has issued 29 Army buses to the

General Electric, Stewart-Warner, Metropolitan Device Corp., Pierce-Phelps Co., Climax Machinery Co., Noblitt-Sparks Industries Co., Tennessee Valley Associates, and the Tennessee Valley Authority. Factories that will make the Tennessee Valley Authority model are at present being selected by Smaller War Plants Corp.

More than a hundred companies have let WPB know they'd like to make home dehydrators.

Rides for Civilians

WPB's bus authorization reflects needs of the transport system in these days of gas and tire rationing.

The automotive industry has another whiff of civilian goods. WPB has authorized production of approximately 7,300 buses and 11,000 bus bodies (BW—Jul. 3 '43, p 78). The action came little more than a month after output of 7,350 medium and heavy trucks for civilian use was allocated (BW—May 29 '43, p 52).

Need Is Obvious—The reason for the bus program is simple: Need for more transit facilities, in these days of gas and tire rationing, is just as pressing as the need for highway hauling units. In addition to the bus manufacturing schedule, WPB started programs for 400 large trailer buses, 1,200 small ones, 3,200 sedan conversions, and 300 street cars.

All this output is scheduled for 1944, but planning for it begins at once, allowing just about the length of time pro-

ducers figure necessary to precede actual manufacturing.

Division of the Business—The bus makers and their basic quarterly quotas are: Beaver Metropolitan Coaches, 50; C. D. Beck & Co., 50; Crown Body & Coach Corp., 15; Fitzjohn Coach Corp., 50; Ford Motor Co., 400; General American Aerocoach Co., 100; General Motors Truck & Coach Mfg. Co., 500; Kalamazoo Coaches, 35; Kenworth Motor Truck Corp., 10; Mack Mfg. Co., 300; Reo Motors, Inc., 100; Superior Coach Corp., 100; and White Motor Co., 200.

These figures total to 7,640 for the year, but G. M. Truck and Mack will not produce in the first quarter, and there are other quarterly variants as well.

Studies of Needs—Meanwhile, WPB is making intensive study of motor trailer requirements and output possibilities for 1944. In May, the Office of Defense Transportation stated that about 16,000 trailer units would be required in civilian channels to meet minimum 1944 transportation needs. WPB is disposed, however, say trade sources, to look with favor upon the briefs of the trailer makers that the requirements are considerably larger.

One matter of importance which WPB and the producers of buses and trucks are now discussing is that of selling price. All vehicles are tagged at maximum prices imposed by OPA. But those ceilings were set up on the basis of costs of 18 months or two years ago, when civilian output stopped. Since then labor rates have risen a good deal, and so have other manufacturing costs. The upshot may be a brand-new set of ceiling prices for the forthcoming civilian automotive goods.



**ABLE TO TAKE IT--
ON THE BATTLE LINE**

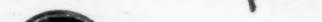
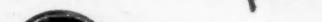
**ABLE TO TAKE IT--
IN THE TOOL ROOM OR ON
THE PRODUCTION LINE**

Built to "dish it out" and take it, too, Uncle Sam's tanks demand tough materials and skilled design to give them stamina and striking power.

The same principles hold for milling machines—the machine tools that are mighty important in building tanks and other weapons. In tool room or on the production line, milling machines must be built to perform at a record-breaking pace and maintain close tolerance-accuracy in operation.

The center bearing on the spindle of Milwaukee Milling Machines reduces by one-half the distance between bearings—*increases rigidity eight times!*

Ask the man at the controls of a Milwaukee—he can tell you how important this center bearing is (in addition to the husky column) in providing built-in rigidity and all that it means in sustained accuracy—longer cutter life—smoother performance at all speeds.



KEARNEY & TRÉCKER
CORPORATION
MILWAUKEE 14, WISCONSIN

Milwaukee MACHINE TOOLS

Buy Victory with War Bonds!

NEW PRODUCTS

JIM, THE DRIVER...

One of a nation-wide army of 17,350 drivers, Jim is typical of the popular, courteous Railway Expressmen who stop at your home, store or factory—whenever there is a shipment to be picked up or delivered by Railway Express.

Jim is out in all kinds of weather—in rain, hail, snow, fog or thunderstorm. Being a Railway Expressman is his career, his life's work.

Today, the principal concern of the Jims of Railway Express is to keep the enormous flow of war materials moving swiftly and uninterruptedly.



RAILWAY
EXPRESS
AGENCY

BUY MORE AND MORE WAR BONDS

NATION-WIDE RAIL-AIR SERVICE

Compact Parachute

Both the Army and the Navy have approved the P3-B Parachute, new product of Pioneer Parachute Co., Manchester, Conn., which is affiliated with Cheney Bros., 1412 Broadway, New York. Although the bias-cut canopy, or umbrella, of the human chute has the



standard military diameter of 24 ft., it folds into a smaller pack. Cheney, which developed a new "1 oz. Nylon Human Parachute Zephyr Type Fabric" for the "silk," reports that "weight has been reduced 30%, thickness reduced 25%" while maintaining the "tensile strength, elongation, tear strength, and porosity" of the former chute fabric.

Pioneer submits that its new back-type model is "the thinnest chute on the market today" and one of the safest. The whole pack is 20% lighter than the P1-B and takes "just half of the seating space formerly required." While the war goes on, the P3-B will give pilot, bombardier, navigator, or gunner just that much more room for the performance of his duties. When the post-war period comes, it promises more compact, more comfortable protection to civilian flyers who are expecting to take to the air in plane, blimp, or helicopter.

Tube-Flaring Tool

More than a year ago, Everhot Products Co., 2055 W. Carroll Ave., Chicago 12, developed Bundyflex soft steel, copper-coated tubing to replace critical aluminum or copper in many gasoline lines, oil lines, refrigerant lines, and other applications. Only trouble was that sometimes in flaring the end of the tubing for attachment to standard fittings, the material cracked.

Now the company is announcing the

new Flaremaster Heavy-Duty Portable Flaring Tool which is designed to produce a double-lap, or double-thickness, flare to "eliminate split and cracked tubes" and with "greater resistance to vibration fatigue." It consists of a pair of holding jaws, a portable vise, and a set of forming punches for different diameters of tubing. It will produce the "correct 45-deg. double-lap flare for S.A.E. flare-type and inverted flare-type connections" on soft steel, aluminum, copper, Monel, and similar tubing.

Weather Stripper

With the heating season fewer than four months away in temperate latitudes, it is not untimely for the J. W. Mortell Co., Kankakee, Ill., to bring out a new weather-stripping material called Mortite Utility Tape. It comes in 80-ft. coils, is applied around windows and transoms or to almost any crack or crevice—without tacks, brads, or tools. Since it is plastic, it sticks wherever it is put; since it remains in plastic condition, the maker says it "can be removed at the end of the season, and used again the next fall."

New Products Briefs

Also reported this week, not only for their interest to certain designated business fields, but also for their possible import in the postwar planning of more or less allied fields and business in general, are the following:

- **Food**—Formulas, and customers, for foods and drinks that call for chocolate and coffee flavors promise to be satisfied with "Choco-Flava" and "Kofe-Flava," new products of Whitehall Food Mfg. Corp., 4006 Second Ave., Brooklyn. They are both unsweetened liquids described by the maker as "combining the concentrated essence of the natural products with other flavors, to bring out their genuine flavor and aroma."
- **Communications**—The job of the rural telephone operator, who must remember to ring "two longs and three shorts" or "one short, one long, and three shorts," may be eased after the war by a new Automatic Code Ringer, patents for which have been just acquired by the Stromberg-Carlson Co., Rochester, N. Y.
- **Electrical**—"BH Fiberglas Sleeving" is a new product of Bentley, Harris Mfg. Co., Conshohocken, Pa., for insulating wires in electric assemblies. It is described as being "flexible as string," non-flammable, nonfraying.
- **Metalworking**—Both cutoff work and forming promise to be speeded on Atlas, Craftsman, Logan, 9-in. South Bend, and similar lathes by a new Lever-Operated Cross Slide manufactured by Kessler Aero Tool Products Co., 211 W. Palm Ave., Burbank, Calif.

Yugoslav
destructive raids across
borders of Italy and Bulgaria, ac-
cording to reports received in the Mu-
sulman [22].

OFFICE NOISE DEMONS KILLED IN ACTION

**Thousands Trapped in CUSHIONTONE
ceiling! Smothered instantly**

Sudden death came to uncounted thousands of unsuspecting noise demons last night, in what is unquestionably the most enormous in the annals of demon history. Intent merely on the

RATTLING typewriters, busy adding machines, loud conversation—all produce noise demons which pound the eardrums of office workers, causing errors, and cutting down efficiency.

But there is an efficient noise demon exterminator. A ceiling of Armstrong's CUSHIONTONE smothers up to 75% of the noise that reaches it, thanks to the 484 deep, sound-absorbing holes in every 12" x 12" unit. Repainting (even with ordinary paint and painting methods) does not affect this permanent high efficiency in the least.

This remedy for noisy offices is surprisingly low in cost. A ceiling of CUSHIONTONE is quickly installed

with little or no interruption to office routine. Maintenance is no problem at all.

CUSHIONTONE offers other advantages, too. Its high light-reflecting efficiency (73%) provides better illumination. Its high insulating properties save heating and air-conditioning costs. And all the time it's quieting unwanted noise.

Get this new FREE BOOKLET

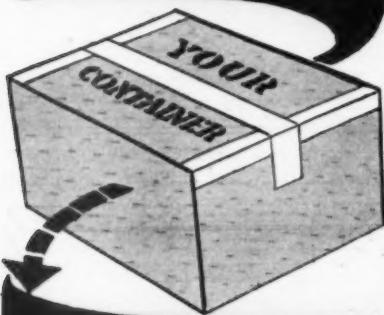
Our new, illustrated folder, "How to Exterminate Office Noise Demons," will show you what CUSHIONTONE has done for other offices. Get your free copy now. Write to Armstrong Cork Company, Building Materials Division, 3007 Stevens St., Lancaster, Pennsylvania.

**Armstrong's
CUSHIONTONE**

Made By the
Armstrong's Linoleum

 makers of
and Asphalt Tile

ON A ONE-WAY
TICKET TO
THE TROPICS



SEALED WITH
SOLSEAL
WATERPROOF TAPE

Excerpts from the diary of a tropics-bound container



"... and when it came to facing the elements, I'm here to tell you I really had to take it! It started when they stood me alongside the other containers on the freight platform (there just was no available warehouse space to keep us snug and dry), half-buried in mud, with rain pelting down on me for the better part of two weeks! ... Then the loading dock... more rain and sleet, enough to make me want to fall apart from waterlogging, but I held up under it in great shape. Once on the ship I was set down in the hold, partially under water the entire trip... water in the hold minimizing the danger of fire under torpedo attacks.

"When I finally arrived at port of destination we didn't dock. To speed things along I was dumped into the ocean to be picked up at low tide... after which I was toed right up to advance positions through pelting tropical rains. You'd think that long before that I'd have burst my seams! ... Not a bit of it. I was sealed with SOLSEAL Tape so that we could stand rain, high humidity and immersion for weeks at time! And did I come through with colors flying? I'll say I did—and how!"

SOLSEAL Waterproof Tape is available in 30/30/30 60/30/30, and 60 lbs. Wet Strength Kraft with Solseal adhesive. Also available string filled for use as a strapping tape. Manufacturers whose containers are subject to high humidity, rain and actual immersion are urged to write for free sample coil with Solseal Solvent for testing purposes. Specify type of Solseal sample desired.



WAR BUSINESS CHECKLIST

A digest of new federal rules and regulations affecting priorities and allocations, price control, and transportation.

Women's and Children's Apparel

Manufacturers' prices for women's, girls', and children's fall apparel have been revised, effective June 29, 1943, to provide manufacturers with an all-year regulation covering both spring and fall lines. The cost-plus-margin method of pricing, already in effect for spring lines, is maintained, and several items previously covered by GMPR, including toddlers' garments and slack suits, have been transferred to the new regulation. The fall, 1942, selling price lines, which are higher than spring lines, are permitted, as well as sales at any selling price line below each manufacturer's highest for the same "category number." If manufacturers wish to use their fall selling price lines, they must file a fall pricing chart with OPA before making deliveries at this level. The fall chart is effective only during the fall and winter seasons; throughout the year, the spring pricing chart—the chart filed with OPA last winter under Regulation 287—is to be used. A choice of methods is offered for determining maximum allowable margins for use with the fall chart. (Revised Regulation 287.)

Machine Tools

Secondhand machine tools have been brought under stricter price control by an OPA regulation which affects rentals of used machine tools, auctioneers' sales, and all rental agreements, and reduces the maximum prices for machine tools which are not rebuilt. (Regulation 1.)

Refractory Commodities

An OPA action affecting basic refractory brick, dead-burned dolomite, dead-burned grain magnesite, and kindred basic refractory products used in the masonry linings of metallurgical and industrial furnaces places these products under a single price control regulation that establishes specific dollar-and-cents prices, effective July 3, 1943, at the same level as the freeze prices which they replace. (Regulation 416.)

Power Equipment

Materials used for the manufacture of power switchgear, including oil or air circuit breakers, metal enclosed or open type switchboards, buses, and related devices, have been brought under control by a WPB action restricting the use of copper in buses or connections, the use of structural steel in outdoor substation structures and framing, and eliminating special finishes and decoration on all switchboards. (Schedule IV, Order L-154.)

Manganese Alloys

Ferromanganese alloys, top-rank ferro-alloys used in steel making, have been brought under dollar-and-cents maximum price ceilings, at essentially the same levels

as those previously in effect. Pricing for both buyers and sellers will be simpler under the revised regulation, for the number of different prices has been reduced from 1,300 to a little over 100. Other alloys covered are substandard ferromanganese, electric furnace ferromanganese, spiegeleisen, silicomanganese, and manganese metal previously controlled by GMPR. Specific differentials are also allowed to cover crushing and grinding of standard ferromanganese. (Revised Maximum Price Regulation 138.)

Steel Castings

A percentage of steel castings specified in MRO emergency load directives is to be reserved by producers to provide for emergency demands for maintenance, repair, and operating supplies on authorized controlled material orders bearing the allotment symbol MRO. Space in monthly schedules is to be reserved for this purpose only up to the lead time date specified for the steel castings in Schedule III of CMP Regulation No. 1. If MRO orders are received after the reserve space has been filled, they are to be treated as any other authorized controlled material orders.

Paint

Changes of formulas in mixed paints caused by orders limiting the amounts of linseed and fish oils used in their manufacture will not necessitate a reduction in manufacturers' maximum prices, provided the revised products give fairly equivalent service. (Order 465, Regulation 188.)

Wooden Container Materials

Producers of any wooden material subject to GMPR used in the manufacture of wooden containers, also subject to GMPR, may apply to OPA for an adjustment of prices under certain conditions. (Amendment 7, Sup. Regulation 15.)

Hinges

A reduction in manufacturers' prices of about 2% to 3% has been effected for hinges and butt hinges by a new OPA order establishing transaction prices on Oct. 1, 1941, as the maximum, and eliminating the increases made on Oct. 10 of that year. The industry's complete line of hinges is represented in the order.

For freighting, practices generally in effect in October, 1941, are continued by the establishment of two zones, with stated procedures for each zone. (Regulation 413.)

Fuel Oil

Important changes in the limitations on the delivery of fuel oil have been effected by a recent Petroleum Distribution Order, replacing WPB Order L-56. With the addition of 14 new states and a part of Florida to the territory in which deliveries of fuel



How Rayon helps keep it hot for Hitler!

YELL CHETNIK at a Nazi soldier and you strike terror into his heart! For over a year now, General Mikhailovitch's guerilla armies have wreaked havoc on the Nazis in Yugoslavia.

Keeping them in the fight has been another war job for rayon! For like any other army, Mikhailovitch's men must be assured of adequate supplies. That's where rayon supply parachutes are turning in a good account of themselves.

Every day they drop guns, ammunition, radio sets, medical equipment, food and other vital supplies to the Yugoslavian patriots in the field.

Here is a fighting job that the average citizen would

hardly dream possible of rayon. And with good reason. For the rayon yarn used in these supply parachutes is far different from that used in ordinary fabrics. It was specially engineered for its purposes in the laboratories of American Viscose Corporation. It must be strong and tough to withstand the sudden shock of the load as the 'chute snaps open.

Adapting rayon to meet special requirements is one basic objective of American Viscose's program of continuous research. As a result of these studies, there emerge constant new uses for this miracle of man-made fibers. Uses that serve America equally well... in war or peace.



AMERICAN VISCOSE CORPORATION

Producers of CROWN* Rayon Yarns and Staple Fibers

Sales Offices: New York, N. Y.; Charlotte, N. C.; Providence, R. I.; Philadelphia, Pa.

★ BUY UNITED STATES WAR BONDS AND STAMPS ★

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*Reg. U. S. Pat. Off.

● From bombs to bookends . . . from tanks to toys, ELIOTT makes the precision tools that help to make the implements of War and of Peace.

We urge you to bring your particular problems to the attention of our engineering research staff. Write for our new Catalog "B" describing our complete activities.

ELIOTT'S ON TIME

THE ELIOTT
Manufacturing Co.
MILFORD, CONNECTICUT
PRECISION TOOL MAKERS

oil are prohibited for use in new equipment installations, or installations converted to fuel oil from other fuels, the entire country is now brought under this control; where new space heaters have been acquired under OPA Ration Order 9, however, fuel oil may be delivered. Deliveries for weed control is also prohibited anywhere in the United States. (Petroleum Distribution Order 13.)

Scrap Rubber

Ceiling prices for scrap rubber consisting of, or made from, rubber tires have been established at levels generally \$2.00 per ton above current prices by an OPA ruling effecting a reduction in the amount of subsidy the government will pay to maintain low prices for scrap. (Amendment 7, Revised Price Schedule 87, as amended.)

Tires

Because inventories of tires and tubes in trade hands are thinning, the limit on the number of times replenishment portions of tire rationing certificates can be transferred from hand to hand within the trade has been removed by an OPA action that voided the requirement that only five transfers be permitted. (Amendment 36, Ration Order 1A.)

Oil Burners

To make available some of the estimated 55,000 Class B oil burners now in stock, a recent WPB action reclassifies burners into three groups instead of two, as here-

tofore, and routes orders for Class B through WPB's Plumbing & Heating Division. Sales and deliveries of oil burners, either assembled or in parts, are prohibited except under an approved order and except for use in areas in which delivery of fuel oil is not forbidden; orders for burners in a restricted area must be accompanied by a copy of the Petroleum Administration for War's authorization for delivery of oil for such burners. (Order L-74, as amended.)

Gasoline Distributors

Railroads, bus and truck lines, and others who buy gasoline solely for their own use have been excluded from a revised definition of licensed distributors. (Amendment 56, Ration Order 5C.)

Gasoline dealers and distributors owning several filling stations must indicate the address of the particular station where coupons were accepted, rather than just the business or firm name and address. (Amendment 57, Ration Order 5C.)

Farm Supplies

Farmers' cooperatives and any other dealers who sell listed farm supplies at cost, or at a markup of not more than 3%, are permitted to replenish stocks on farmers' certificates on a dollar-for-dollar basis; formerly a dealer could obtain only 75% of the dollar amount of his sales. (Priorities Regulation 19, as amended.)

Rationed Foods

The following orders affecting rationed foods have been issued by OPA: General RO 11, Replacement of Rationed Foods; Amendment 41, RO 13, Rationing of Food and Food Products, Processed Foods; Amendments 41 and 42, RO 16, Meats, Fats, Fish, and Cheeses.

Retail Groceries

Further relief to groceries in Classes 3 and 4 (BW-Jul. 3 '43, p.72) has been granted by OPA action permitting those who have suffered hardship—principally in Class 4—under retail soap and retail beef, lamb, mutton, veal, and pork regulations to be reclassified as Group 1 if they can satisfy certain conditions. (Amendment 6, Regulation 336; Amendment 7, Regulation 355; Amendment 1, Regulation 390.)

Rent

By an amendment to the rent regulation for housing, an owner whose property is changed from unfurnished to fully furnished on or after July 1, 1943, need not petition for an adjustment but may set his own rental by registering the changed accommodations with the Area Rent Office within 30 days from the time he first rents on a fully furnished basis. The rent he charges may be decreased if it is found to be higher than rents for comparable accommodations on the maximum rent date. (Amendment 2, Rent Regulation for Housing.)

Refrigerators

Retail and wholesale price ceilings have been established for new iceboxes. Manufacturers' ceilings, however, continue under

WAR PRODUCTION EDITION
of this well-known guide
to executive leadership

Shows how to deal
with problems of:

By ERWIN H. SCHELL, Professor of Business Management,
Massachusetts Institute of Technology

Price, only \$2.00

SHOWS that executive technique is not a mysterious sixth sense, but a quality that can be definitely developed by anyone who will follow the simple methods laid down in this manual. Defines the tools of executive control; outlines the factors involved in the successful handling of others; gives practical and usable methods for getting a maximum output of work with a minimum amount of friction. In this edition a new chapter discussing the influence of the current emergency upon the various techniques of executive control has been added.

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330 W. 42nd St., New York 18, N. Y.
Send me Schell's *The Technique of Executive Control, War Production Edition*, for 10 days' examination on approval. In 10 days I will send \$2.00, plus few cents postage, or return book postpaid. (Postage paid on cash order.)

Name _____

Address _____

City and State _____

Position _____

Company _____



BW-7-10-43

See it 10 days
on approval

SEND THIS COUPON

Old Poker-Face is Losing Caste



BUYERS who imitate the clam and play their thoughts "close to the chest" never were very popular. They are less so now. "Not interested," is a dangerous reply in these days of new ideas, new ingredients and new processes.

Wise buyers lay their cards on the table nowadays. They talk their problems and hunt new ideas to rub against their own. They welcome men whose minds will click with theirs to produce a "2 + 2 = 5" result. Synergistic thinking is the name for it and it is a growing habit in American industry.

So many new discoveries have come out of the laboratories that it takes synergistic thinking to discover the full extent of their usefulness. Furthermore, the ability of chemists to evolve low-cost synthetics of materials expensive to produce in a natural state has expanded tremendously the commercial applications of these products for wide-scale use.

Vitamin C is a case in point. The value of Vitamin C to prevent scurvy, "trench mouth" and similar diseases has been

known for some years. More recently its value has become apparent for treating shock, preventing heat prostration, healing wounds and treating various types of industrial poisoning.

The synthesis of Vitamin C and the development of manufacturing methods by pharmaceutical technicians is one of the major achievements of American organic chemistry. By producing sorbitol, the starting material for the synthesis of Vitamin C, Atlas is helping make this "Victory Vitamin" both inexpensive and plentiful.

The very existence of commercial developments of sorbitol is a practical invitation to synergistic thinking with Atlas men on the part of many companies who may profit by the opportunity to utilize sorbitol and its derivatives.

We will welcome the opportunity to practice synergism on sorbitol with you.



ATLAS

POWDER COMPANY
WILMINGTON 99, DELAWARE
Offices in Principal Cities

Industrial Explosives • Industrial Finishes • Coated Fabrics • Acids
Activated Carbons • Industrial Chemicals • Ordnance Materiel

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"Hold it! . . . that bolt is murder!"

A BROKEN CHAIN, repaired with a bolt, is a constant threat to men, materials and equipment. It might crash the load and far worse, it *might* crush nearby workers.

We build chain to carry heavy loads and to withstand considerable abuse. But in these hectic days, with heavy pressure on output, even careful, conscientious workers sometimes take chances. They feel that dangerous short cuts are excusable, now and then, to get the job out on time.

To prevent ignorant, heedless or reckless handling of chain, we recommend following the National Safety

Council's Safe Practice Pamphlets a few suggestions from which appear at the left.

American Welded and Weldless Chains are among the many products we build for Industry, Transportation, and Agriculture, essential in peace, vital in war.

National Safety Council Offers these Suggestions on Chain Safety

1. Don't overload a chain. Know the safe capacity of the chain you use.
2. A wide angle between legs of a chain sling increases the strain. Never overlook this when figuring sling capacity.
3. Don't strain a chain by knotting, kinking, crossing or by jolting starts and stops.
4. Be sure that chains are regularly inspected and records kept. Don't use one which has stretched or shows defects such as cracks or wear in links.
5. Never bolt chain links together, regardless of the purpose.



In Business for Your Safety

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT, CONNECTICUT

In Canada—Dominion Chain Company, Ltd. • In England—The Persons Chain Company, Ltd., and British Wire Products, Ltd. Aircraft Controls, American Chain, American Cable Wire Rope, Campbell Cutting Machines, Ford Chain Blocks, Hazard Wire Rope, Manley Garage Equipment, Owen Springs, Page Fence and Welding Wire, Reading Castings, Reading-Pratt & Cady Valves, Wright Hoists and Cranes

ulation 188, and models that were in wholesalers' or retailers' hands on June 8, 1943, but which are not now offered for sale, governed by GMPR. (Amendment 1, Regulation 399.)

Wooden Fence Posts

For all principal grades of wooden fence posts, specific dollar-and-cents prices have been established at production, wholesale, and retail levels throughout the country. (Revised Maximum Price Regulation 324.)

Taxis and Taxicabs

Taxis, as well as drivers and operators, are covered by the new order covering taxicab fares that takes effect immediately and replaces General Order ODT 20. To eliminate 50% "dead mileage," beginning Oct. 1, 1943, a passenger cannot be driven from one municipality to another which forbids picking up of passengers for the return trip. (General Order ODT 20A.)

Cotton Fabrics

Manufacturers' cents-per-yard ceilings for 150 additional constructions of fine cotton fabrics have been established, in most cases at lower levels than those that have been in effect. A total of 100 prices has now been set for such constructions. (Amendment 7, Regulation 11.)

War Priority Actions

Some restrictions on glass containers are removed by WPB Supplementary Order 34. . . . WPB has issued Direction 19, Part Reg. 1, to govern deliveries of tin, short tins, and tin mill black plate to manufacturers. . . . Food Distribution Order 44, which required packers to use 60% of the 1943 pack of canned salmon, bonito, and yellowtail, has been revised so that, effective June 28, about 100,000 lb. of these canned fish will be available to civilian consumers. . . . Restrictions on use and delivery of citric acid have been established by WPB Allocation Order 21, as amended. . . . An optional set of restrictions on motor trucks used for certain peddling in the East Coast gas shortage area has been established by ODT to permit retail deliveries under certain conditions, regardless of the size and weight of the packages.

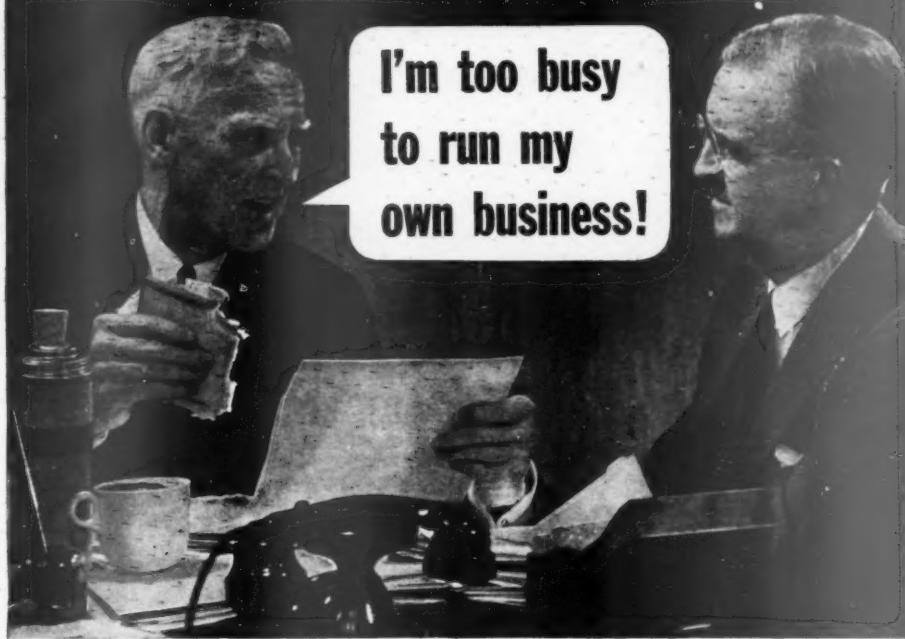
War Price Actions

Prices of better rayon fabrics have been removed from the provisions of Regulation 12 and placed under GMPR, by Amendment 12 to Regulation 127. . . . Increases in the prices of wooden doors and sash manufactured from lumber released under GMPR Order L-290 have been authorized by Amendment 1, Regulation 293, by offering discounts $\frac{1}{2}$ to $1\frac{1}{2}$ points. . . . Directive 25 provides that charges for gas and electricity in new, privately financed housing projects may be added to the minimum rentals now permitted in war areas. . . . Used all-wool sanforized fine blankets and used all-wool palmer fine blankets, sold by sanforizers and finishers, are brought under GMPR Amendment 17 to Revised Sup. Regulation 1.

Business Week • July 10, 1943

Paper and printing multiply manpower

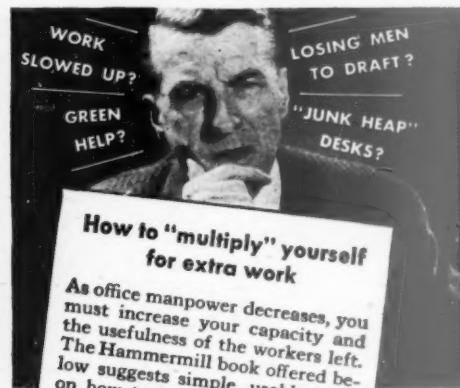
**I'm too busy
to run my
own business!**



"SURE, THE LABOR SHORTAGE IS BAD. But my biggest headache is shortage of management. A third of my key men have gone into uniform or government posts. Trying to replace them, plus all the other demands on my time, leaves no chance to do my job. The pressure is getting me down — it's hurting my health and business."



"I WAS IN THE SAME BOAT. Jack, until my printer gave me this little Hammermill book. It tells how you can at least lighten the load by putting more jobs upon paper. Shows how to organize your day's work, free your time for more vital work. I'll leave my copy with you."



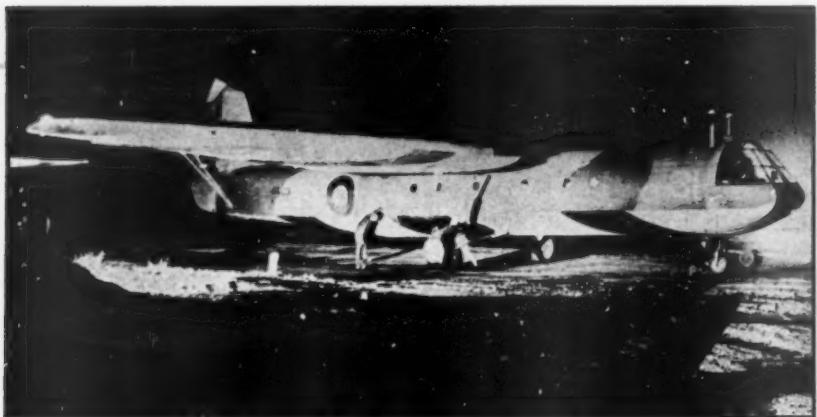
How to "multiply" yourself for extra work

As office manpower decreases, you must increase your capacity and the usefulness of the workers left. The Hammermill book offered below suggests simple, usable ideas on how to increase personal efficiency, clear desks and minds. Smoothing the flow of executive and administrative work is Hammermill's contribution to America's war effort . . . to your war effort. Use this service.



"*Recipe for an Orderly Desk*," new little book by William Feather, business writer, shows how to organize your work, get information, pass it along, check results and responsibility. For your free copy, attach coupon to (or write request on) your company letterhead and mail it to Hammermill Paper Company, Erie, Pa. Dept. BW-7-10.

Name _____ Position _____



MOTORLESS TRANSPORT

Only a few years ago, neither the British nor the American air forces had gliders; now both are stocking up in

huge quantities. Pictures taken at an English airdrome show the size of one of the R.A.F.'s motorless craft. With these mammoth carriers, the R.A.F. is training for day or night operations.

THE WAR—AND BUSINESS ABROAD

U.S. Capital Flows South

Though natives will retain administrative control, many U.S. industrial enterprises, with an eye on postwar trade with the Latin Americas, are expanding their operations in Brazil.

SAO PAULO—The pattern of participation by U. S. investment capital in Brazilian industry varies widely. But the extent of investment conforms with the appraisal of the prospects made by Business Week's Foreign Editor during a tour of South American republics last year (BW—Nov. 28 '42, p18) and lends substance to predictions of a postwar boom in trade between the U. S. and Latin America which Eric A. Johnston, president of the U. S. Chamber of Commerce, has been making since his swing around the circuit.

• **Steel Project Aided**—In the Volta Redonda steel plant project, the U. S. firm of A. G. McKee & Co. is employed as consulting engineer in the purchase and installation of equipment; 46 U. S. technicians will go to Brazil to supervise installations. Another U. S. firm, McNally Pittsburg Mfg. Corp., having conducted coke experiments with Brazilian coal, is supplying the equipment for Volta Redonda's big coal-treating plant.

For the Itabira iron mining project, the U. S. engineering firm of Parsons, Brinckerhoff, Hogan & MacDonald is executing the three-year job of installing mining equipment, reconditioning the railway, and improving the port at Victoria. Although Itabira and Volta Re-

donda are backed by the Export-Import Bank, both are predominantly Brazilian-managed in accordance with Latin-American insistence on local control.

• **Panair Building Airports**—Another example of successful U. S.-Brazil collaboration is provided by Panair do Brasil, subsidiary of Pan American Airways System. Panair not only handles the bulk of Brazilian passenger and cargo traffic, but also is constructing eight big strategic airports for the Brazilian government on which it will get 20-year leases. Formerly headed by an American, Maxwell Jay Rice, Panair is now entirely under Brazilian management, has decided to increase its capital from \$25,000 to \$1,750,000 by local flotations.

Still another form of U. S. capital participation is seen in the development of the Brazilian government aircraft engine factory (also designed to make tank and tractor engines) near Rio de Janeiro. The Export-Import Bank has lent \$2,000,000, and the Wright Aeronautical Corp. and Fairchild Aircraft Corp. have entered into agreements with the Brazilian government to manufacture Wright Whirlwind engines and Fairchild training monoplanes.

• **Goodyear Expanding Output**—Of particular importance in Brazil's program

of rubber and tire production—and future tire export trade with Latin America—is the expanding output of the Goodyear Tire & Rubber Co., S. Now producing tires and tubes for aircraft and trucks in the São Paulo factory, the company has a five-year contract with the U. S. government for \$50,000,000 of finished products and \$105,000,000 of raw rubber.

A recent entrant in the industry field is Monsanto Chemical Co., which controls a major part of world caffeine production and has formed a Brazilian company to produce caffeine and the bromine from surplus cocoa now cut off from overseas markets (BW—Apr. 24 '42, p74). Monsanto is building a \$400,000 factory at Bahia and will supply technicians to get operations under way this year.

• **Armco Rolling Mill**—Another American firm planning postwar expansion is American Rolling Mill Co., which recently boosted the capital of its Brazilian holding from \$100,000 to \$500,000 and has obtained a big contract to air-condition the spectacular hotel-casino at Quitandinha. Armco's postwar program involves setting up a steel rolling mill for products not made by Volta Redonda.

International General Electric Co. has recently increased the capital of its Brazilian affiliate, General Electric S. A., to \$2,000,000 from \$1,600,000 and is reported to be taking over the electrification of the federally owned Central do Brasil R. R. which a British concern, Metropolitan Vickers, was unable to complete because of the war.

• **Lamp Factory Enlarged**—I.G.E.'s R. lamp factory has undergone a \$550,000 expansion program and soon will be able to turn out 45,000,000 lamps a year. The plant also will make transformers, meters, and electric irons. A research laboratory is being built and glass-making facilities installed.

For a \$1,000,000 electric motor plant in São Paulo, I.G.E. has bought a 3-acre tract, and leveling of the ground has begun. Scarcity of building materials and machinery probably will delay completion of this project until after the war.

• **Buying Local Firms**—The Brazilian subsidiary of the British Imperial Chemical Industries, Ltd., which joined some years ago with the American affiliate of E. I. du Pont de Nemours & Co. to run important chemical and munitions factories in Brazil, has shown a 1942 profit of \$700,000, reported to be extending its holdings by buying up local concerns.

Despite stringent laws forbidding foreign holdings in national mining concerns, the federal government last year approved joint exploitation by American Smelting & Refining Co. and a Brazilian concern, of the large nickel ore deposits in Goyaz state. Devel-

ment of the 1,000,000-ton ore body was impeded by lack of fuel, electric power, and transportation—the nearest railhead being 200 miles away. So far, American Smelting & Refining has been exploring the site while the local concern plans roads. Last year, the local company increased its capital from \$30,000 to \$400,000, and although details of the arrangement are secret, it is believed that American Smelting's participation is on a 50-50 basis with a federal guarantee that profits can be transferred abroad and that a \$5,000,000 capital investment can be made.

• **Lure for Capital**—Brazil's recognition that capital is needed to develop its resources is evidenced by the proposal last year, put forward by the Technical & Financial Economic Council, a government advisory board, that Article 143 of the constitution (restricting exploitation operations to nationals) be amended to permit foreign concerns or mixed foreign-Brazilian firms to receive concessions for not more than a 50-year period.

The official attitude toward future foreign investment is that foreign capital is welcome and that profits may be transferred abroad, but the administration of the concerns must remain in Brazilian hands. Only in this way is it considered possible to prevent foreign commercial and industrial interests from clashing with national interests. Important for the foreign investor to remember is that local taxes (income and remittance) take an 18% bite out of profits sent abroad.

Airlines South

Systems in Latin America expand by leaps and bounds as result of war; British-owned railways join in race.

BUENOS AIRES—Latin America has entered the air age without fanfare. Yet the 44 operating airlines serving Central and South America fly 106,828 route-miles—compared with 50,000 in the U.S.—and have 750 scheduled stops—compared with a U.S. total of 260.

• **Top Place for P.A.A.**—Divisions and affiliates of the Pan American Airways System dominate the picture, but national and private Latin-American lines play an important rôle. Five of the ten biggest lines are in the Pan-Am. family: Pan American Airways operates 19,738 route miles, Panair do Brasil 11,060, Pan American-Grace Airways 7,436, Avianca 6,460, and Compania Mexicana de Aviacion 5,322.

With air traffic constantly expanding, key ports in the Latin American network now have weekly flight traffic—exclusive of military and ferry-plane op-



1 man can do it...

Fifteen men can "manhandle" a whale of a lot of material. BUT 999 times out of a thousand one man and a Towmotor can do the same job in less time and at lower cost. It's merely a matter of moving many units as one load, stacking higher to obtain additional storage space, releasing man-power for more productive work, and . . .

But there's too much to tell here. If you want all the facts, send for a copy of our new manual, "The Inside Story." It's free; just write Towmotor Corporation, 1221 E. 152nd Street, Cleveland, Ohio.



TOWMOTOR



THE 24-HOUR ONE-MAN-GANG

The War—and Business Abroad • 101

erations—that would be no disgrace to most U. S. cities:

Mexico City.....	109 flights
Camaguey	74 flights
Rio de Janeiro.....	71 flights
Buenos Aires.....	56 flights
Barranquilla	53 flights

• **Traffic Is at New Highs**—Emergency movements of critical materials, travel of war agency officials and technical experts and missions, and disruption of coastwise shipping have maintained operations at top levels throughout Latin America. Pan-Am. has conducted adver-

tising campaigns to explain its inability to cope with the traffic (BW-Mar. 27 '43, p59). A key to the situation is found in data on Panagra's west coast operations:

	First Quarter 1942	1943	('000 omitted) % Increase
Miles flown..	810	1,111	37
Passengers ...	10	15.5	55
Pass. miles ...	7,847	12,302	56
Express (lb.)...	195	530	173

In Argentina, connected by air with the north by P.A.A. lines to Asuncion,

Paraguay, and Porto Allegre, Brazil, and with Chile and Bolivia by Panagra, government subsidized lines are likewise booming. Chief among these are Aeroposta Argentina S.A., Corporacion Sudamericana de Servicios Aeronauticos S.A., L.A.S.O., and Aerovias.

Aeroposta operates along the Atlantic coast south from Buenos Aires with Junker planes and owes its fast development to deliveries of German equipment and government premiums for mail cargoes.

Corporacion Sudamericana flies two



"It would have been a different story . . ." if Pan American Airways System had been operating in the days of Noah (above, left) and Hannibal (above, right). Pan-Am.'s affiliate, Compania Mexicana de Aviacion S. A., makes the same point in ads which show its big passenger liners breezing past Pegasus (left) and the man in the seven-league boots (right). Choosing the famed Mexican artist Arias Bernal to execute these back-cover color ads for the Mexican magazine Hoy, Pan-Am. sets a fast pace for American concerns currently extending advertising campaigns to Latin America. Best reason for more advertising following this lead is the fact that Latin America likes it.



"How Little-Known Safeguards Protect the Home You Can't Replace Today!"

These extra services provided by fire insurance companies have reduced average insurance rates 40%... yet profits have averaged only 2½¢ out of each premium dollar!



"**Dear Home Owner:** I suppose millions know that, because of war, they couldn't rebuild a home that burned today. But few realize this: Leading fire insurance companies I represent provide many seldom-heard-of extra services that guard our homes and lives and vital industries from fire. Among these are:

FIRE PREVENTION ENGINEERS

To keep fires from starting, hundreds of trained men check our towns and cities regularly—study fire hazards, water supply, alarm systems—to help authorities plan better fire protection. Today, these men are making thousands of special checks to safeguard war industries, materials and food.



"In 30 years, such services as these have reduced both the rate of fire loss and the average cost of fire insurance by more than 40%! Out of each premium dollar, 97½¢ on the average has been applied to the payment of policyholders' losses, taxes and other necessary costs of operation. Only 2½¢ has remained as "profit"—to strengthen the companies' ability to pay unusually heavy losses if they occur in the future."

Respectfully,



Your Fire Insurance Agent

...representing the Leading Fire Insurance Companies who maintain the National Board of Fire Underwriters, a non-profit organization for public service in fire prevention, founded 1866.

FREE! 42 ways to keep your home from burning. Fire prevention specialists have prepared interesting guides and checklists. Among them are: hints that might save your family's lives if fire does strike... ways to spot fire hazards in your job or business. They're FREE—ask your insurance agent—or mail coupon today!



NATIONAL BOARD OF FIRE UNDERWRITERS,
85 John Street, New York 7, N. Y.

Please mail your **FREE** material on fire prevention in my Home Farm Business (Please mention kind of business _____)

Name _____

Address _____

City _____ State _____

DELIVERING MORE HORSEPOWER FOR

Battle Power



ADEQUATE control of power-flow over the power "roadbeds" of your plant, will minimize power loss. Rugged Dodge Friction Clutches, stationed at proper places on your line shafts, assure positive control, and release capacity loads, without loss . . . delivering more horsepower to production machines, to boost battle power!

One of several popular types of Dodge Clutches for line shaft power transmission or for mobile clutch-operated machines, is the Dodge Solid Friction Clutch . . . outstanding for its sturdiness, simplicity and economy. It can be furnished for use as a cut-off coupling or with sleeves for mounting pulleys, sheaves, gears or sprockets. Simple one-

point adjustment provides take-up for any wear on the friction surfaces.

The super-ruggedness, compactness and simplicity of Dodge Clutches typify what Dodge has done throughout 65 years of service to industry (embracing three major wars), to assure dependable power transmission.

The nearest Dodge Distributor can help you determine whether Dodge Solid, Split, Expanding Ring or Diamond "D" Clutches will answer your requirements . . . and can help you with present or future plans for efficient power transmission. In the complete Dodge line of power transmission equipment you will find "The Right Drive for Every Job."

DODGE MANUFACTURING CORPORATION, Mishawaka, Indiana, U.S.A.

Throw All You Scrap Into the Fight

DODGE
MISHAWAKA

Buy
More U. S.
War Bonds



THE RIGHT DRIVE FOR EVERY JOB

routes from Buenos Aires: to Colonia, Uruguay and to Asuncion, Paraguay. One of these lines uses Fiat planes, and the company is reported to be heavily in debt to the Italian government for equipment received. The Argentine government subsidizes mail deliveries.

L.A.S.O. is primarily a military line, government operated, but has recently commenced passenger services which have put its nonprofit operations heavily into the black. The line is a training school for military pilots who fly the planes mainly to the west and south of the country.

Most significant recent development in Argentine aviation is the sudden display of interest on the part of British railroad owners with an eye on postwar business. No contracts have been signed, but the heads of the Buenos Aires al Pacifico R.R. have approached Aerovias with a view to joint operations after the war.

Already the railroads are participating in bus lines which parallel or supplement their systems, but this latest move is apparently being undertaken in close liaison with Imperial Airways, Ltd. The possibility of obtaining planes in the near future is slight, but a final objective is suspected to be the linking of Argentina with Imperial Airways' lines running to Africa and the Orient.

• British Idea—Since the Argentine government takes a paternalistic interest in domestic lines, the British hope to operate through companies owned and operated locally and favored by government subventions and contract preferences.

Although only one railroad is definitely in the market for airline connections now, the interdependence of rail networks is a safe indication that other lines will enter the picture before the scheme reaches the contract-signing stage.

Australia's Role

With half its population in war work, and war expenditures topping two billions, island is a big supplier in South Pacific.

Australia went all out for war when Japanese troops swept to its doorstep early last year. The island continent can now claim that half its population is directly or indirectly at war work, that armed forces number nearly 500,000 (70,000 airmen); and that current fiscal year war expenditures will top \$2,000,000,000.

On the industrial front, Australia has assumed a major rôle as supplier for South Pacific operations, producing guns, tanks, planes, instruments and gages, and food—the last an all-important item contributed under reverse



As you fly high over mountains, comfort-wise you'll be riding through them

 As tomorrow's airliner climbs up over great mountain ranges, your pressurized cabin will "ride" you through them with all luxurious comfort of low altitude. Here's the story of an AiResearch development that will make this feat possible for you.

Began before the war when engineers were making plans for great new planes to fly the *upper air*—where storms can be avoided and flight smoother, faster, safer.

Always before, the discomfort of flying up where the atmosphere is thin set a ceiling for transport flight. At 8,000 feet, many people's ears began to pop. Above 10,000, some got sleepy, even dizzy.

So a special group of engineers began devising ways to "pressurize" the cabins of transport planes. In this group of air control specialists were our engineers here at AiResearch. They now report that the pressurized cabin for postwar air travel is assured.

What does this mean to you? It means that in your commodious post-

war airliner, flying perhaps at 20,000 feet, with the temperature of the thin air outside an icy 10° below . . . you on the inside will keep as comfortable as in your own living room!

• *From warborn AiResearch experience will come many new peacetime conveniences for homes, offices and farms, as well as for future travel.*



 "Where Controlled Air Does The Job". Automatic Exit Flap Control Systems • Engine Coolant Systems • Engine Oil Cooling Systems • Engine Air Intercooling Systems • Supercharger Aftercooling Systems



Number One cause of industrial accidents is FALLS. Many falling accidents are caused by slippery floors—floors soaked in oil or grease. You can effectively control this hazard in your plant by covering your oily floors with SPEEDI-DRI, which provides an immediate non-skid surface and rapidly removes entirely the film of oil that causes so many accidents. SPEEDI-DRI soaks up oil like a sponge, even drawing old oil from wood, concrete, or metal floors.

If SPEEDI-DRI did nothing but reduce your accident experience, it would be well worth its moderate cost. But it does much more. Light in color, it improves plant visibility by light reflection. It saves workmen's shoes from oil-rot. It is an effective fire-retardant. Because it can be spread by hand and easily removed, it conserves vital manpower. It eliminates the need for expensive scouring. It does its work while the shop is in operation, without interfering with production for a moment. SPEEDI-DRI makes your shop safer, cleaner and brighter. Casualty companies actively recommend its use!

SPEEDI-DRI costs less per square foot of floor coverage than any other effective method or product! For proof, send for a FREE SAMPLE of SPEEDI-DRI and test it yourself. (If you use water-soluble oils, or if water is also present, ask for SOL-SPEEDI-DRI.)

SPEEDI-DRI OIL AND GREASE ABSORBENT



SUPPLIERS

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REFINERS LUBRICATING CO.
New York 1, N. Y.

Midwest and South
WAVERLY PETROLEUM PRODUCTS CO.
Philadelphia 6, Pa.

West Coast
WAVERLY PETROLEUM PRODUCTS CO.
Menlo Park, Calif.

Prompt Service from Warehouse Stocks in Leading Cities

lend-lease to United States units in area.

• **How Industry Grew**—In September 1939, there were 548,000 factory workers in Australia; today there are 700,000. In addition, employment in government and semigovernment owned plants has climbed from 13,500 in 1939 to 51,500 today. Before the war, Australia had machine tool plants making fewer than 100 tools a year. Today there are more than 75 plants, and tools produced on order total 20,000. There are 188 tool and gage shops producing 26,000 tools and gages daily.

To facilitate defense of the continent and to supplement the many 27,000-mile rail system, Australia is extending highways to criss-cross the populated hinterland. More than 500 of new industry is being located away from the coast. Electric furnace capacity is being expanded—how much is a guarded secret—and the tin industry is thriving due to war-expanded production of Tasmanian mines.

• **New Ammonia Plant**—The chemical industry, now producing about 150,000 pounds of explosives components, recently welcomed the addition of an ammonia plant built by Imperial Chemical Industries, Ltd., and in other war lines, every major brings some new plant development.

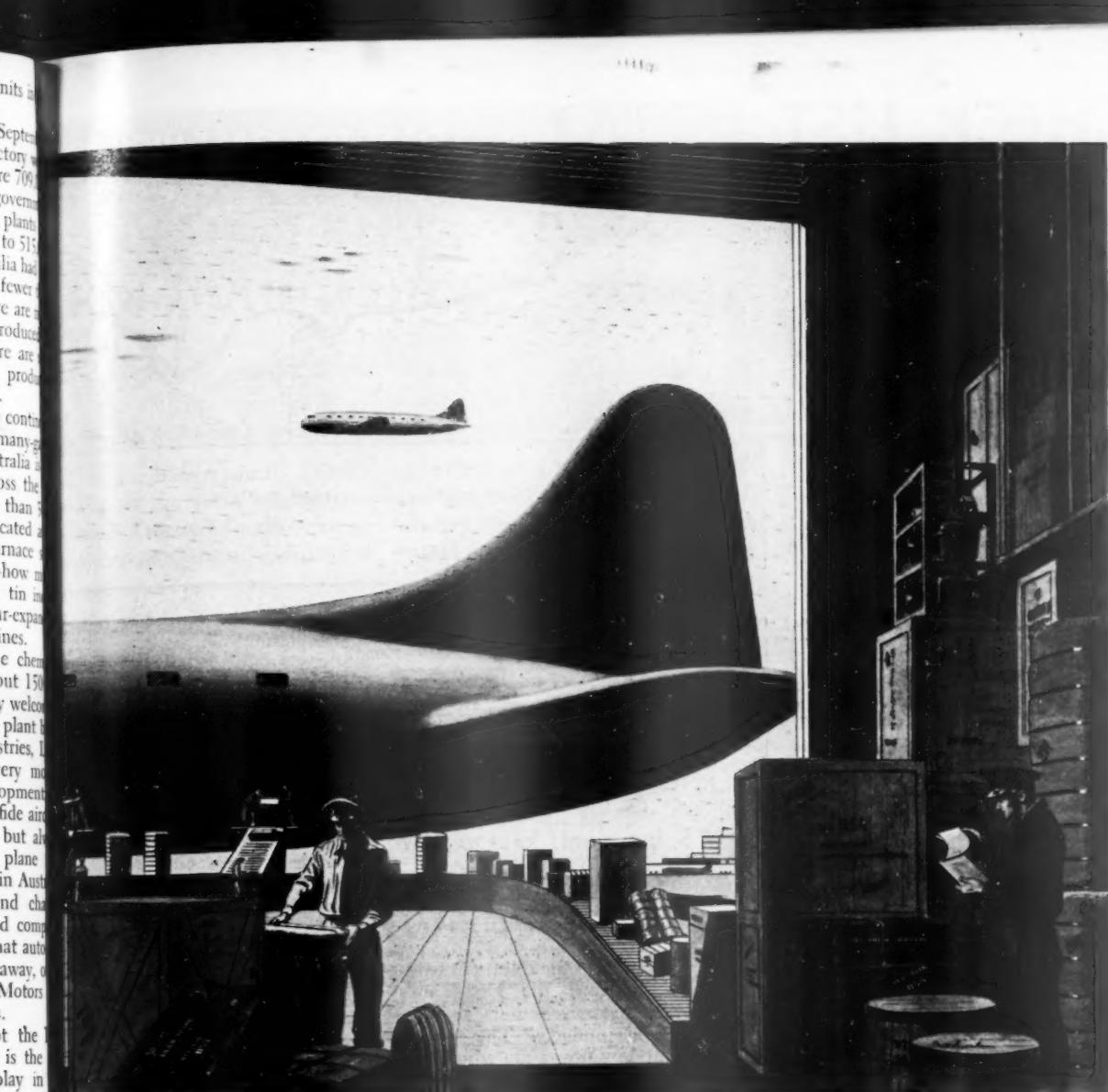
One of these was a bona fide aircraft engine plant—long wanted, but always discouraged. Traditionally plane auto bodies have been built in Australia around imported motors and chassis, but the wartime turn toward complete plane production is a hint that aircraft engine output may not be far away, offering a challenge to General Motors' Ford branch assembly plants.

• **Postwar Competition**—Not the least of Britain's postwar worries is the Australian enterprise will play in the South Pacific-Indian Ocean region where competition will be keen among Australia, India (BW-Jun.1943, p. 10), and Britain. With two Australian lines proposing world-wide service, it has already been made clear that government will foster, protect, and perhaps manage the lines. It is rumoured that a semigovernment monopoly will be in the automobile business after the war.

PORUGAL TO BUY OIL

Portugal will soon detail two tankers to carry 120,000 tons of petroleum from the United States at the rate of 10,000 tons per month. The deal has been arranged with the approval of Britain and the Axis belligerents.

Both Portugal and Spain have recently boosted their merchant tonnage by acquisition of interned vessels. Spain gained seven ships totaling 22,000 tons and Portugal grabbed eight large ships and 18 fishing boats totaling 54,000 tons at a cost of close to \$6,000,000.



Trade Ships in the *Age of Flight*

regular scheduled passenger, mail and *Mainliners* flying over the Main Airway carry out only one of the world's wartime jobs. Other United are flying routes in this country to nations beyond on strictly military missions. They are helping to pave the way for a new era of vastly expanded *—the Age of Flight.*

ious cargoes borne by clipper ships of old will seem insignificant compared with those of the Age of Flight. For many trade ships of the future will be giant airplanes which know no geographical barriers. They fly routes, not only all over the world, but between principal cities in every country as well.

Fast and flexible, one of the airplane's thousandfold jobs will be to carry the world's most priceless materials and merchandise . . . things so valuable or so urgently needed that they will go by air.

Along with many regular kinds of cargo, vital shipments of precious metals will fly. Expensive perishables which cannot endure long, slow voyages will be sent by plane. The needs of emergencies and disasters will be met with airplane shipments of medicines, serums, food and replacement machinery and equipment.

Although the airplane may not be regularly used to carry heavy freight, it will serve like the ships of old, to open up distant rims of the world

where rare luxuries are found. The airplane can fly direct to places reached in the past by only a handful of explorers. And along with its pioneering will come profitable routes for all forms of transportation.

Just as we now hinge so many of our hopes for Victory on the airplane, so can we look to it for new and fuller blessings of life in the Age of Flight.

★ *Buy War Bonds and Stamps for Victory* ★

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CANADA'S FIRST COAST-TO-COAST HIGHWAY



The 4,074-mile road from Halifax to Vancouver, nearly half of it gravel, has been completed by closing the gap between Geraldton and Hearst

(arrow). It was rushed as a war measure, but with one eye on a postwar opening up of Canada's hinterland for settlers, prospectors, and tourists.

CANADA

Problem in Trade

Canada would like to sell some of its big wheat surplus to U. S. but wants to stop flow of scarce food to this country.

OTTAWA—On the critical food sector, Canada is reported to be seeking U. S. cooperation in the solution of two divergent problems: the Dominion's surplus wheat supply and its shortage of other food products. The concessions sought by Ottawa are admittedly difficult for Washington to grant:

(1) Wartime mutual-aid suspension of the U. S. 42¢-per-bushel tariff on Canadian wheat.

(2) Consent to Canadian embargoes on transborder shipments of Canadian food products in short supply.

• **Elevator Problem**—Canada would like to unload a substantial part of its current 650,000,000-bu. wheat carryover in time to empty local prairie elevators for the new harvest which is expected to boost stocks above 900,000,000 bu. Although large quantities of wheat will go to Russia—much of it as flour—and Ottawa will finance off-season movements of feed grain, congestion is anticipated in the wheat-country elevators.

Canadians see the prohibitive U. S. tariff against their wheat as a relic of the ultranationalistic economic expediency doctrine of the prewar period which obstructed free trade and international interdependence. They feel that support of these ends calls for removal of the wall barring Canadian wheat from its nearest market.

• **Aware of Pitfalls**—In order to minimize Washington's already sizable diffi-

culties with the farm bloc, Canadian representations on tariff reduction are hesitant for the moment and aim at partial reduction on a temporary basis.

On the other side of the food problem, Ottawa sees in the blow Congress dealt to Roosevelt's price control program an upsetting of the applicant U. S.-Canadian pooling of food sources, planned some time ago (BW Jan. 16 '43, p40). The basis of this view is the rapidly widening differential between Canadian and U. S. prices and its effect on Ottawa's efforts to maintain supplies under Canada's anti-inflation policy.

• **Pattern for Operation**—Congressional ban on subsidies increases Ottawa's anxiety over the drain across the border of foods badly needed at home and Britain. A solution may be found in the precedent set on meat: All Canada's surpluses will go exclusively to Britain by agreement between London, Ottawa, and Washington.

Washington consented to a Canadian ban on sales across the border to enable Canada to fill Britain's needs. Ottawa would like to extend this principle to other food supplies produced this year which Canada cannot afford to leave.

BEER FOR THE TROOPS

Canadian liquor control boards will find out soon just how many militiamen are in their territory. Under new regulation, Canada's beer output will rise 5% (it was cut 10% last December) for the summer months to provide the equivalent of one gallon of beer per month extra for each member of the armed services now in Canada.

Liquor control boards will receive extra allotment of beer in proportion to the number of Army, Navy, and Air Force members residing within a province. The determination of quotas rests with the military authorities.

This Sewing Machine Motor Started Something!

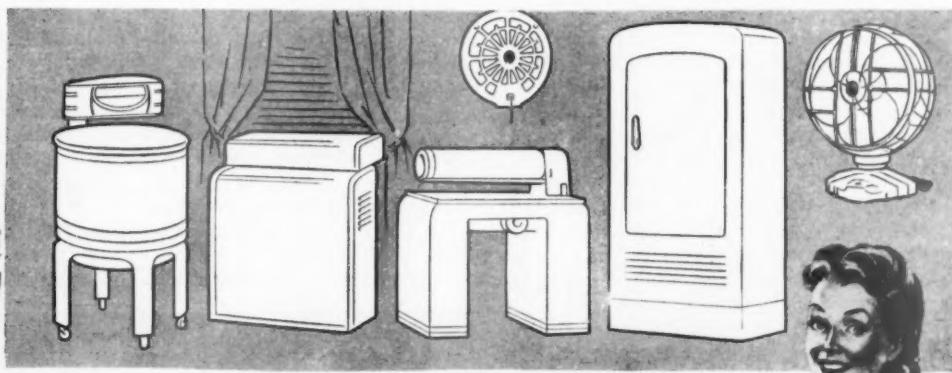
An historic event—at the turn of the century—was the development of an Emerson-Electric Motor for attachment to the foot-power sewing machine, then in use.

This simple motor application marked the beginning of an era in which an entire industry was founded, bringing a multitude of labor-saving, motor-driven appliances and comfort conveniences for the home.

Throughout this long period, Emerson-Electric Motors have played a major role in powering these appliances. They have lifted the yoke of household drudgery and created the opportunity for American Womanhood to achieve a fuller life.



THE ELECTRIC MOTOR ENTERS THE HOME!
Sewing Machine reproduced from Emerson-Electric advertising of 1899



Types of Home Appliances Powered by Emerson-Electric Motors

When war came, the entire resources of Emerson-Electric's 53 years' experience were quickly converted and tremendously expanded for manufacturing vital implements of war—power-operated revolving gun turrets, shell parts, and many new types of electric motors for aircraft.

Out of the urgencies of war will come entirely new conceptions of electric motor design, construction and efficiency. "After Victory", manufacturers of the new and improved motor-driven appliances and equipment will confidently power their products with these motors.



"Until the war, I never fully appreciated the importance of the electric motors on my home appliances."



In recognition of their "patriotism and great work", Emerson-Electric workers were presented with the Army-Navy "E" Award.

811

EMERSON ELECTRIC

MOTORS • FANS • APPLIANCES • A. C. ARC WELDER

LABOR

Security for All

Wagner bill's program to expand insurance benefits may seem buried in committee, but it is very live politically.

The New Deal's latest social security program, which was presented to Congress in a bill introduced by Sen. Robert F. Wagner (BW-Jun. 12 '43, p7), is reposing quietly in files of the Senate Finance and House Ways & Means committees. To all appearances, it has dropped into the murky limbo of forgotten issues.

• **Politics of the Plan**—But the appearances are, in this case, misleading. Behind the scenes, some carefully directed and high-powered activity is going on, and by the end of this year, or early in 1944, social security will re-emerge as a very lively issue. Along with inflation, it is slated to be a domestic point of major emphasis in the election campaign of the Administration and its supporters, and such a weighty political matter is not being left to develop haphazardly.

The Wagner bill itself is only a vehicle. To it will be attached a number of other social security proposals which have not yet been presented to Congress or brought into the arena of public debate.

• **Various Provisions**—As it stands now, the bill is a relatively simple measure which would amend the Social Security Act to expand its coverage and increase its benefits. It would increase and prolong unemployment payments, enlarge old-age and survivor benefits, provide medical and hospital insurance, assure federal grants-in-aid to states for care of the needy, and finance the elaborated program through payroll contributions of 6% each from employers and employees.

Thus the reorientation of our present social security system, under the Wagner proposals, is largely a matter of degree. Except for adding medical and hospital benefits, it only widens and deepens channels of social insurance.

• **Emphasis on Americanism**—In presenting it to the Senate, Wagner took pains to emphasize that it was in the American tradition and geared to American standards. The stress was adjudged politically desirable because of the wide publicity accorded the social security program formulated for Great Britain by Sir William Beveridge.

Actually, the Wagner bill does differ materially from the Beveridge plan which puts more than half of the cost

of operating the program on Britain's general treasury whereas the New Deal scheme is to be financed by higher social security taxes. The Beveridge plan also provides for the same contributions and same benefits for all classes and groups with variations only as to sex and number of dependents; in contrast, the Wagner bill directly relates both contributions and benefits to past wages, as well as dependents, and adjusts automatically to different standards of living, wage scales, and family needs of wage earners in different sections and industries throughout the country.

• **Other Differences**—The British program's now-famous cradle-to-grave feature, which provides a guaranteed minimum income for life, is not duplicated in the American scheme which maintains definite limits on the duration of insurance benefits for unemployment, temporary disability, and hospital care. Nor does the New Deal's social insurance program encompass the coverage of such insurable items as workmen's compensation, marriage and birth grants, children allowances, dental care, home nursing, and medicine, all contained in the Beveridge plan.

Nevertheless these contrasts, though fundamental, serve only to disguise a common intent of the Beveridge and Wagner plans. Both are advanced because of postwar considerations, and this marks a departure for American social security philosophy.

• **Sticking to Main Idea**—Up to now, our social insurance program has operated with a distinguishing single-mindedness. Its purpose was to aid the needy

and cushion some of the hazards of the individual.

If, as a byproduct, its functioning exerted some salutary influence on the labor market, helped to maintain employment and production, or tended to minimize seasonal unemployment, that was all to the good. But it was always social insurance for social insurance's sake; other considerations were distinctly secondary. Now, with grave postwar economic problems looming, New Deal economists want to make social security a means to an end.

• **Inflation Argument**—Thus, in introducing his bill, Wagner orated on the theories of inflation. One of the most compelling arguments he advanced was that an increased payroll and wage tax would narrow the inflationary gap by absorbing some excess purchasing power, cutting down war accumulated liquid savings which may be expected to go into the consumers' goods market immediately on the close of hostilities.

Other such broad considerations hardly associated with social security are in the New Dealers' minds, some of them still unformulated and all of them still more or less unexpressed. They will be trotted out in time to make campaign issues.

• **The Older Workers**—One of them is certain to be concerned with clearing the labor market of oldsters to make places for returning soldiers. There are now, for example, an estimated 600,000 workers in covered employment who are over 65 and eligible for old-age payments which they don't get as long as they work. Each year another 200,000 become eligible.

By raising old-age pension payments, many of them could be induced to retire. By lowering the retirement age to 60, over a million and a half more



Imported by the Rockefeller Foundation, Sir William Beveridge, British cradle-to-grave planner, has assisted the New Dealers in drumming up public interest in the Administra-

tion's postwar social security program. Making a series of personal appearances, Sir William and his wife (above) flank A.F.L.'s William Green on one of their "courtesy visits."

The little steel trap that fooled the Japs

Up saboteurs pulled a stunt in the Philippines that would have had tragic consequences—if it had worked.

They poured melted wax into our supply of 100-octane gas, hoping our engines would be dead... permanently.

While under Jap cross-fire, engines of our T-boats stopped. Inspection showed the filters clogged with wax. Our men had to clean the wax out every hour. But the point is, that the filters stopped the wax from getting into the motors! If they hadn't, we'd have been no "eggshell" exploits.

The filter wire is a development of U.S. Steel... stainless steel wire finer than human hair, so thin that it takes twenty miles of it to make a pound!

Such developments from the 174 laboratories of U.S. Steel are helping to make our armed forces the best equipped in the world.

Look for steel marvels after the war

Stainless steel is now limited to war materials. But after the war, improved stainless steel, and many other war-improved steels, will be available for your use in manufacturing peacetime products. These better steels will hold new possibilities of finer quality, bigger markets, and more efficient manufacturing methods for American industry. And these new steels will make the U.S.S. Label a more powerful sales aid than ever on the goods you produce.

NEW STEELS FOR AMERICA

BUY WAR BONDS EVERY PAYDAY

The money you loan builds America's war strength. Yours again to spend in years to come... for new comfort, products of steel, things for better living.



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—measure low pressures of gas, air, liquid, e. g., gas pressure at burner, furnace draft, liquid level in tanks; also differential pressures across air filters, pressure drop across valves and orifices. • Accurate, inexpensive—the result of 32 years' specialization. Ask for Catalog C-10.

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POST-WAR PLANS

Ford, Bacon & Davis
Incorporated
Engineers



Uncle Sam's War Chest

calls for a BILLION DOLLARS A MONTH in War Bond sales. Do your part by buying the limit . . . and by encouraging your employees to set aside at least 10% of the gross payroll in War Bonds, through the Payroll Savings Plan!

would become eligible. The potentialities of such sliding eligibility is apparent when it is recognized that more than one-third of the persons employed in May were 45 years of age or older.

• **Subsidized Joblessness?**—Opponents of such schemes have maintained that they are only a form of subsidizing unemployment, but such epithets will not be strong enough to deter politicians who want to provide employment opportunities for returning soldiers. A similar expansion of social insurance to cover the marginally handicapped would attract thousands more out of the labor market.

Behind-the-scenes activity on social security is not confined to theorizing and planning. Political maneuvering goes on at an accelerating rate. Beveridge's visit to this country under the sponsorship of the Rockefeller Foundation, for example, has been utilized by the New Deal to put some wind in its social security sails.

• **Oxonian Persuasion**—Beveridge, who has been here since mid-May and who will return shortly to England, has been talking about the good life in an Oxford accent to influential business groups like the Chicago Assn. of Commerce and San Francisco's Commonwealth Club.

He has been in close liaison with Social Security Board officials.

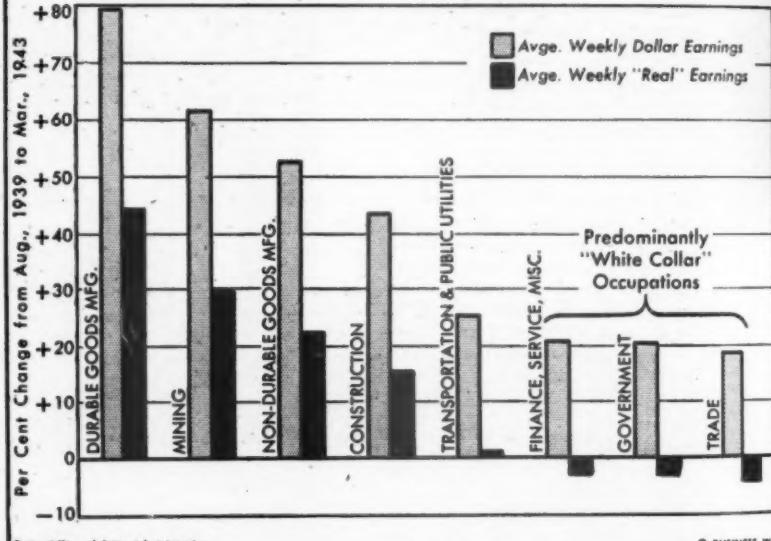
Meetings between Social Security Board officers and labor representatives go on all the time. The A.F.L. and C.I.O. must be kept sold on the program (in its mild Wagner bill form it will jack up a worker's wage tax from what was to be 2% in 1944 to 6%), for they are being counted on to be the base of the contemplated mass support.

Union Bypassed

Circuit court affirms right of individual to squawk to boss at North American, despite the U.A.W.'s grievance machinery.

J. H. (Dutch) Kindelberger has won an important round in the fight for his "bring your squawk to the boss" idea. President of North American Aviation, Kindelberger set up a procedure about a year and a half ago whereby his employees might bring their grievances direct to him even though his contract with C.I.O. United Automobile Workers includes the usual channels for han-

"WHITE COLLAR" PAY SQUEEZED



Since the start of the war in Europe, the white collar class has been squeezed between relatively fixed wages and a rising cost of living. So far, real wages have remained just about even with the board in three predominantly white collar occupations—trade, government, and services. (Imperfections in Bureau of Labor Statistics computations make the white collar statistical position somewhat darker than it really is.) But by

comparison with other wage groups, the white collar contingent is far behind the parade. In manufacturing, mining, construction, and transportation and public utilities, wages have been lifted steadily by (1) lengthening of the work-week, time-and-a-half for overtime, and (2) increases in pay rates. The length of the white collar work-week has remained almost the same as it was in 1939, while wage rates have moved uphill but slowly.



SHAPER OF THINGS TO COME

... too, is a Baldwin. This Southwark Plastics Press will be a bright new world for you to live in. It will mold the future in a hundred unsuspected ways. Today this press—and others like it—are turning powdered chemicals into laminated board, bomber noses, canteens, stocks... dozens of vital instruments of war. Tomorrow it may be giving you elastic glass, a house of plumbing that never corrodes, furniture that never gets stale and tickety, finishes that never need painting. These are not dreams. The ideas are ready...the materials are ready...the equipment is ready. The expanded demands you did not have to wait for the slow development of larger, bigger, faster presses, for Baldwin engineering and Baldwin experience was ready. And there will be no hesitation in meeting the needs of peace.

These presses are just as truly weapons for America as the guns that Baldwin makes, the tanks it turns out, the shells it forges...or the locomotives it builds.



BALDWIN

The Baldwin Locomotive Works, Philadelphia, Pennsylvania:
Locomotive & Ordnance Division; Baldwin Southwark Division;
Cramp Brass & Iron Foundries Division; Standard Steel Works
Division; Baldwin De La Vergne Sales Corp.; The Whitcomb
Locomotive Co.; The Pelton Water Wheel Co.; The Midvale Co.



Baldwin serves the Nation which the Railroads helped to build

the Boston symphony is available

THE IDEAL VEHICLE TO CARRY YOUR MESSAGE TO THE AMERICAN PUBLIC

The Blue Network offers a radio program of unusual distinction, The Boston Symphony, in a special sponsorship!

24 regular winter-season concerts—under the direction of SERGE KOUSSEVITZKY.

16 Pops and Esplanade concerts under the direction of ARTHUR FIEDLER.

A total of 40 full-hour Saturday evening broadcasts of the world's greatest and best loved music by America's top symphony orchestra—and your opportunity to address a weekly sales or institutional message to a ready-made audience of unusual responsiveness—an audience from all over the U. S.—which sent in more than 12,000 answers to musical questions in three weeks.

All this—the Boston Symphony Orchestra and radio time—are available to you at an attractive "package" price. For further information write or telephone

The Blue Network

A Service of Radio Corporation of America
NEW YORK • CHICAGO • DETROIT
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"My son was wounded in Africa"



CHICOPEE

makes the gauze that makes
first aid and battle dressings

"A few months ago, he came to my pad boy. He was wounded and unable to look fine in his uniform. We were glad. "Now he's three thousand miles out. "How do I feel about it? How would you feel?"

"I'll tell you something. I've been working on this machine for a few years. Every day hundreds of yards of gauze are ground out of us. It's making us clean material that might be put on any man's wound."

"Then, the telegram came: 'Your son has been wounded in action...' I couldn't sleep."

"I'll tell you something. I've been working on this machine for a few years. Every day hundreds of yards of gauze are ground out of us. It's making us clean material that might be put on any man's wound."

"I know the Army Medical Department is doing everything it can and more. I am my boy is getting the best treatment he can be had. That's why we've got to do everything we can and more to make up those men plenty of bandages."

"How do I feel about it? I know my son, I'd like to get back to work."

Every morning Ossie Stapp's fellow workers and him in there's one of his son. Then, they work hard to do their job, feeling no part of his son. Many of them have come and brought their wives. Everyone knows some here or is the Armed Forces. This is a typical factory. We say with pride that our employees, people like Ossie Stapp, have learned the importance of what we're doing. They know that we need them, that America needs them, that America needs them.

CHICOPEE MANUFACTURING COMPANY, CHICOPEE, MASS.

ADS FOR MORALE

Basic manufacturers whose products are vital but not obviously military face particular problems of worker morale. Such a firm is Chicopee Mfg., employing more than 2,000 in three plants producing gauze for surgical dressings and a variety of military textiles. Having no Army-Navy E or

ding beefs through the union's grievance committee (BW-Jun. 6 '41, p. 60). • **Union Filed Charges**—Kindelberger maintained that section 9(a) of the Wagner Act, permitting individuals to present grievances, allowed employers to define grievances as all individual disputes including the application of contract terms. About a year ago, the U.A.W. went to the National Labor Relations Board with a charge that Kindelberger's interpretation of section 9(a) set up an unfair labor practice.

The board issued a complaint against the company, held a hearing, and finally ordered the company to abandon the practice as unfair to the union. Kindelberger refused to comply and the board

other official stimulant, Chicopee this week began a personalized advertising campaign to impress workers with the importance of their jobs. In newspapers covering plants at Chicopee Falls, Mass., Manchester, N. H., and Gainesville, Ga., the Ferry-Hanley agency is placing six 3-page ads (above)—ten days apart. The Army Medical Corps approves of the idea.

went to the U. S. Circuit Court of Appeals in San Francisco for an enforcement order.

• **Setup Sustained**—Last week, the court upheld Kindelberger's procedure, maintaining that the act "includes a right preserved to the employee of presenting grievances at any time to the employer."

The court declared: "No doubt the reason for section 9(a) is that under the scheme of collective bargaining, bare majority controls the whole body of employees and that in this circumstance the right should be preserved to the individual (or a group) to go to the employer with any grievance he may harbor notwithstanding any provisions in the collective bargaining agreement."

Recruiting by Air

Seattle tries radio appeal for women workers and finds program brings results where other methods failed.

A twice-weekly radio program called "Jobs for Women" is proving to be the most effective answer Seattle has found to its manpower shortages. In four weeks' time, from April 16 to May 14, "Jobs for Women" was responsible for the placing of more than 2,200 in war industries and in essential civilian lines. Goal Believed in Sight—The rate of response increases with each broadcast, and it is expected that the total number placed by July 1 will total between 12,000 and 15,000. If so, the largest part of Seattle's labor-supply problem, which last year had become acute enough to cause the city to be listed as a Group I critical area by the War Manpower Commission, will have been solved. The listing of Seattle in "Group I critical" led to the formation of a Seattle labor-industry committee on labor supply last February and to the adoption of the radio program. The committee is composed of three union officials from the labor division of the Civilian War Commission and three industrialists from the prime contractors' division of the Seattle Chamber of commerce.

Early Efforts Disappointing—A city-wide registration of Seattle women had been undertaken as far back as last summer, a disappointing 6,000 registered (W-Aug. 15 '42, p24). Seattle firms of various kinds recruited women, but not in the necessary volume. Hence there were serious doubts that needed women workers were to be had. However, it was decided that a certain type of radio program might get the desired results. "Jobs for Women" is 15 minutes over KJR, Seattle's Blue network station, every Wednesday and Friday at 11:45 a.m. It is paid for by the Seattle Chamber of Commerce. Addressed solely to women, it features Mrs. Gilson, a professional commentator.

How It Is Handled—Each broadcast follows a set pattern. During the first three or six minutes, the commentator discusses the importance of women to the war program and cites examples of the extent to which Seattle-manufactured war materials are helping win battles. Out-and-out appeals are made to listeners to accept jobs in war plants and in essential civilian lines. The remainder of the broadcast is devoted to an outline of specific jobs available, experience required, hours, type of clothes to wear, age requirements, wages and, etc.

So a Soldier May Quench His Thirst!



DESERT water bags, produced on Union Special industrial sewing machines are among thousands of sewed articles upon which the well being and success of our armed forces depend. To help speed the flow of such items, Union Special offers a complete line of specialized equipment plus a vast store-house of knowledge gained in working with needle trades manufacturers handling Government contracts for sewed goods and clothing for war workers.

Union Special Sales and Service offices are located in principal centers throughout the world. They are "General Headquarters" for wartime sewing problems. Feel free to call on them.



Here are just a few of the vital sewed articles Union Special is helping make available in vast quantities.

UNIFORMS

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MOSQUITO BARS
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MATTRESS COVERS

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ON BOARD ship, it's **DEPENDABILITY** that counts in the compressed air supply. Now, in wartime, more Quincy Compressors than ever before are supplying compressed air on a great variety of craft. They produce compressed air to operate temperature control devices, winches, air hammers and pneumatic tools; to actuate pneumatic clutches on ship's maneuvering mechanism, and to raise and lower the platform doors on the bow of tank-landing barges. They supply air to start heavy Diesels and to blow "hang-fire" and waste gases out of gun barrels. Performance of Quincy Compressors is "built-in" . . . the result of 20 years of specializing in air compressor manufacture. The Quincy line is complete, with sizes to meet every requirement. Let Quincy Specialists help you with your compressed air problems.

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A new folder showing Quincy mobile air compressors and their interesting applications all over the globe. **YOURS . . .** on request! Write Dept. W-5.



QUINCY COMPRESSOR CO.
Quincy, Illinois

Branch Offices
New York Washington Chicago St. Louis San Francisco

No Pay Increase

NWLB ruling gives shot in the arm to hospitalization insurance, which now numbers its subscribers in the millions.

Employers with frozen wage scales, casting about for other means of keeping workers happy, have hit upon free group hospitalization insurance. In announcing that membership in its 77 Blue Cross hospital plans will probably reach 12,000,000 this month (compared with 10,458,899 last January), the American Hospital Assn. concedes that part of the boom may be due to a Mar. 23 National War Labor Board ruling that hospitalization insurance payments by employers, deductible for income tax purposes, are not considered wage increases.

• **Some Firms Are Cautious**—Although many employers had gone on this assumption, cautious firms hesitated to inaugurate free hospitalization insurance after the wage freeze last October. Most employers now offering it pay only the worker's insurance premium; a few pay for his entire family's protection. Blue Cross memberships now are 95% in groups organized through business firms—150,000 of them. Other groups are slower to organize.

The group hospitalization movement got under way about ten years ago with subsidies from the Julius Rosenwald Fund. By 1937 it had gained 600,000 members, became affiliated with A.H.A., whose Hospital Service Plan Commission serves as its national headquarters. It has paid out \$170,000,000 for members' hospital bills.

• **Individual Corporations**—Each plan is a separate corporation which earns its Blue Cross identification by meeting certain standards on community service, professional sponsorship, nonprofit organization, and financial solvency. Each determines its own services and fees, varying from 50¢ to 80¢ a month for individuals, \$1 to \$2 for families.

The 2,500 participating hospitals now represent 80% of the bed capacity of all U. S. hospitals open to the public, as well as some government hospitals which accept paying patients. In addition to Blue Cross plans, group insurance companies and commercial hospitalization insurance organizations have a combined membership of upwards of 3,500,000, and many labor unions operate private plans.

• **For the Greatest Number**—Present trend in Blue Cross policy is toward low-priced service for more people rather than semiluxury care for a few; some of the newer plans offer subscribers a choice of ward service or semiprivate rooms.

Most plans now exclude certain

special treatments and contagious and nervous and mental diseases, but a movement is afoot to abolish such restrictions.

Blue Cross is unperturbed by the shifting balance between subscribers and family members from 63% subscribers and 37% family participants in 1937 to the present 47%—53% ratio. But it's keeping a weather eye on the hospitalization provisions of the Wagner bill for expanding the national social security program, now before committees of both houses. Blue Cross believes hospitalization can be provided most satisfactorily by private enterprise without private profit.

NEW RULES ON OVERTIME

The Bureau of Internal Revenue, which has jurisdiction over compensation adjustments of salaried employees earning more than \$5,000 a year and over executive, administrative, and professional personnel who receive less than that amount, has responded to numerous inquiries on overtime by declaring that approval of the bureau must be secured for overtime salary payment which are not in accord with a plan that has been in effect, without change since Oct. 3, 1942.

This means that any employer who wants to compensate a salaried employee for increased working hours can do so legally only by applying, through his regional deputy, to the Commissioner of Internal Revenue. Internal Revenue has formulated two rules which, if observed by an employer should assure approval to his application:

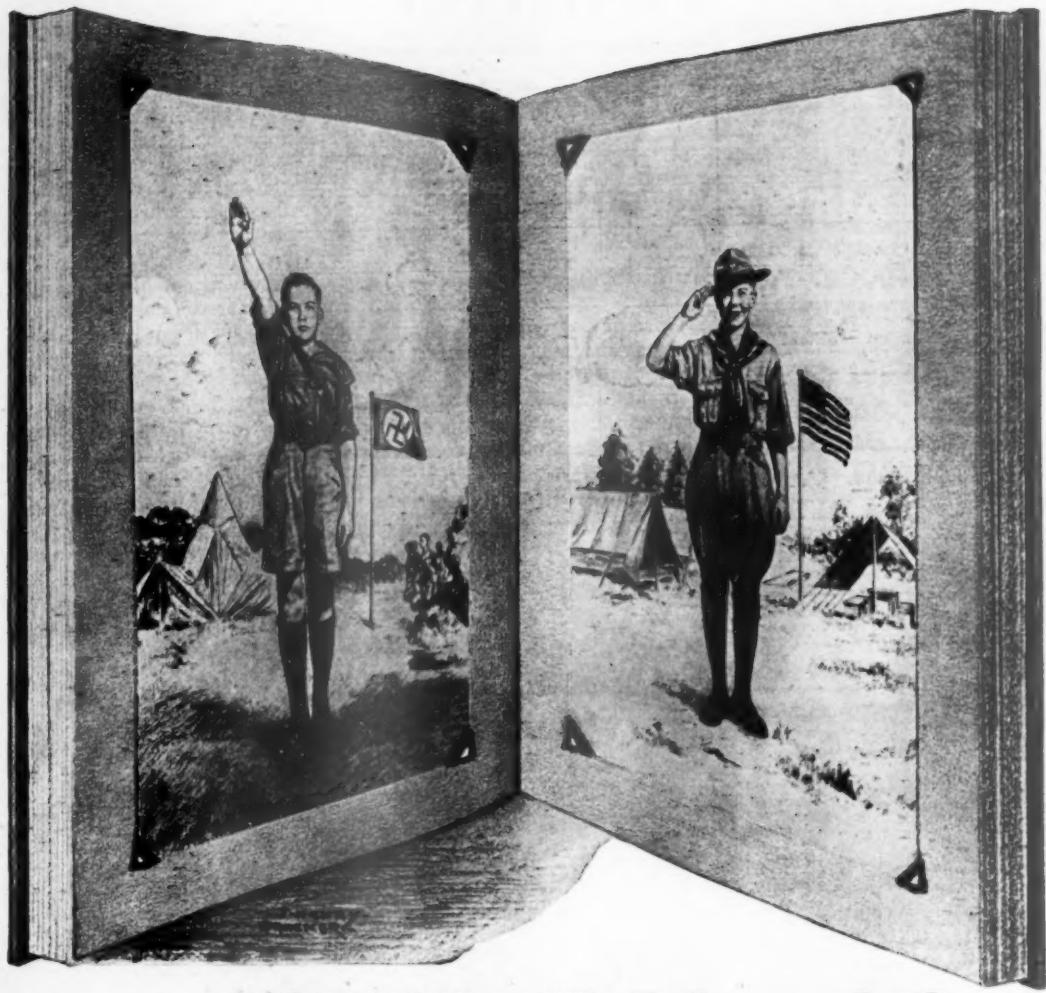
(1) Overtime rates to salaried employees should not exceed those paid to the highest hourly paid employee provided the salary in question is no more than the wage of the hourly paid employee.

(2) The amount allowable to the highest rated hourly employee should then be progressively reduced for the several intervening pay levels so that each succeeding higher level receives a proportionately lesser amount.

ARBITRATION SOUGHT

One of the first visible results of the passage of the Connally-Smith antistrike bill over the President's veto was action by the National War Labor Board advising employers and unions to provide for arbitration of unsettled grievances to prevent strikes.

NWLB has followed a regular practice of ordering arbitration machinery installed in cases where existing grievance machinery has become a subject of dispute. It was evident that the board would extend this practice if employers and unions failed to take its rather pointed hint.



... WHICH will Johnny be?

• Without question, no red-blooded, freedom-loving American father or mother would want Johnny to be like that misguided, regimented Nazi lad. America's sons have a priceless heritage of Freedom that no führer-trained, goose-stepping Nazi youth can understand or enjoy.

Here, in the GULF SOUTH, we're helping to fight for the preservation of Johnny's freedom. No sacrifice or effort we must make

is too great to make sure that the youth of America shall never be the mere pawn of a tyrant dictator. That's why we're working night and day—the same as the rest of the nation—to wipe out the Nazi

menace. That's why the Gulf South's rich resources, its industries, and its manpower are concentrated in and dedicated to one objective—doing their all on the home front to back up our men on the fighting front.



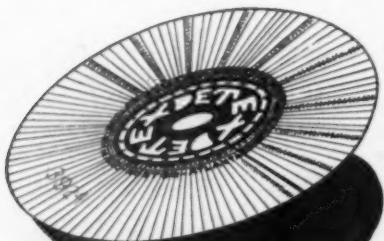
The Gulf South
Working with All America for VICTORY

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UNITED GAS PIPE LINE CO. A Natural Gas transmission Company built in peacetime... now dedicated to serve wartime fuel requirements throughout the Gulf South.

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The **DETETEX DIAL** is the heart and brains of the **DETETEX WATCHCLOCK**. Precisely printed on long-fibred, non-abrasive paper, it offers a perfectly-embossed record, with no chips to clog the clock mechanism. Do not risk makeshift substitutes. Genuine watermarked **DETETEX DIALS** may be purchased without priorities.

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WATCHMENS CLOCKS
NEWMAN * ECO * ALERT * PATROL

"Still puffing that pipe, Jack?"

"Sure—it's COUNTRY DOCTOR
PIPE MIXTURE"



Yes, Country Doctor IS DIFFERENT. On duty or off, at work or play, you'll find it soothingly cool with not a bit of bite or burn. Years of careful testing and blending of eight of the world's finest tobaccos produced superbly fine Country Doctor Pipe Mixture.

COSTS ONLY A PENNY A PIPEFUL

Country Doctor *Pipe Mixture*



For particular Pipe Smokers

If your dealer doesn't have it, write Philip Morris & Co. Ltd., Inc., 119 Fifth Avenue, New York, N.Y.

FINANCE

On the Other Foot

Politicians often demand insurance rate cuts, but now policyholders seek war-risk cut from the government.

Government-written war damage insurance celebrated a quiet first birthday last week. And the year was even quieter than the birthday.

Since the first flood of applications petered out last summer, everything has been running smoothly for the War Damage Corp. Its main problems now arise from the fact that policyholders think life has been too simple for it.

• **Tremendous Volume**—In dollar volume of policies, war risk covered is by far the biggest thing in the property insurance field. During the past year, WDC has written some 4,700,000 policies and assumed the risk on about \$124,500,000 worth of property of various sorts. (Fire insurance companies write coverage on about \$66,000,000,000 worth of property annually.)

On these policies, WDC took in something like \$137,000,000 in premiums, and after paying all expenses, it had about \$124,000,000 left in the kitty. Premium income was small in

comparison with the volume of coverage, reflecting the low rate on war-risk insurance. Stock fire insurance companies (accounting for about 85% of the business) collect better than \$500,000,000 a year in premiums, but they have to pay losses and build up reserves.

• **Virtually No Claims**—Claims on policies written during the past year have been negligible. The only ones to come up have been a couple of cases where patrol planes crashed and damaged insured property. WDC pays off on any destruction by enemy action or American forces resisting the enemy, but the only things that would bring big losses would be an air raid or an invasion.

WDC also is handling some \$63,000,000 in claims resulting from the attack at Pearl Harbor and the capture of the Philippines, but these are separated from the regular policies. Just after the war started, Congress authorized free coverage for all property in the United States and its possessions until WDC could organize a system of premium-paying insurance.

• **Delay Inevitable**—It set up a fund of \$100,000,000 to pay off claims, but so far only \$200,000 has been paid out. Much of the balance won't be ascertainable until after U. S. troops get back to the Philippines and see how much damage has been done.

The free insurance ended July 1,



PRECIOUS COTTON

It looked just like any other bale of cotton, but the first grown during the 1943-44 season came on New York's Cotton Exchange floor flanked by Powers models to bring a record price

of \$600,000. It was a war bond promotion. Bidding lulled when the price climbed to \$500,000; then Jerome Lewis (left) of H. Hentz & Co. took it away with a check for \$600,000 worth of bonds made out to William S. Jung, Cotton Exchange treasurer.



Buy War Bonds and Stamps

Maybe he's your boy

He had waited anxiously for this moment. Then, early one morning, his instructor hopped out of the Boeing PT-17 Kaydet and casually waved this youngster off on his first solo.

He felt a chill, a sinking wave of uncertainty, and then excitement . . . the exultant climactic realization that "This is it!" He shoved the throttle ahead and for the first time in his life lifted up into the sky . . . on his own!

When he climbed out of the sturdy trainer, he glowed with expansive pride. He was a *flier* now, and gloriously happy.

If you had been there, you'd have seen him give his Boeing Kaydet a friendly pat. For, like all fliers, he feels a real affection for the primary trainer that first lent him wings.

If your son, or brother, or that boy from down the street, is now in the Army or Navy flying services, chances are that he, too, received his first flight instruction in a Boeing designed and built airplane. For more Army and Navy pilots have gotten their initial training in Boeing primary trainers than in any other primary training planes. Boeing has

delivered, all told, more than 7000 expertly engineered, soundly constructed Boeing Kaydets to the United Nations.

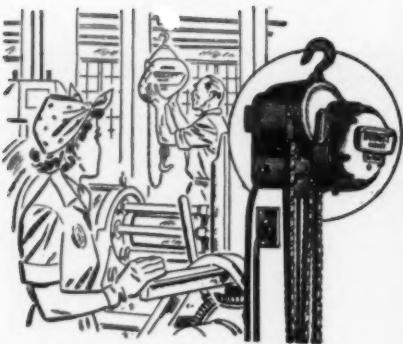
Boeing Kaydets are built at Boeing's plant in Wichita, Kansas. Not as spectacular as their big brothers, the Flying Fortresses,* they are, nonetheless, built to the same unyielding standards of design, engineering and manufacture.

Boeing products have always exceeded the claims advanced for them. True today, it will be equally true of any product tomorrow . . . if it's "Built by Boeing" it's bound to be good.

DESIGNERS OF THE FLYING FORTRESS • THE STRATOLINER • PAN AMERICAN CLIPPERS

*THE TERMS "FLYING FORTRESS" AND "STRATOLINER" ARE REGISTERED BOEING TRADE-MARKS

BOEING



Installed in two minutes

HANG UP, plug in! Those are the installation instructions for the 'Budgit' Hoist.

With this portable electric hoist, older men and even women are able to take over work formerly done by strong men.

The physical strength and mental energy of workers are no longer sapped by lifting, therefore they produce more at less cost—and are healthier, happier employees. No longer do they fear back-strain or rupture.

'Budgit' Hoists by the many thousands are proving their value in war industries in practically every State in the Union and for almost all kinds of war production.

'Budgit' Hoists are portable, electric hoists with lifting capacities of 250, 500, 1000 and 2000 lbs. They are priced from \$119 up. Hang up, plug in, use. For information, write for Bulletin 356.



'BUDGIT' Hoists

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Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of Ashcroft Gauges, Hancock Valves, Consolidated Safety and Relief Valves and 'American' Industrial Instruments.

*American Industrial Instruments.

THE MARKETS

Trading in listed shares on the stock exchanges this week claimed less of the financial community's attention than generally has been the case in the recent past. There was, for example, a major side show staged in the markets for farm commodities. Moreover, investment bankers were beginning to hope for a modest revival in flotation of new securities.

• **Congress Aids Grains**—Tuesday's outburst on the Chicago Board of Trade, under the leadership of rye which shot up the 5¢ maximum allowed for any single day's trading, typified the excitement generated by Congress' revolt over subsidized rollbacks of food prices. The strength in grains was not well maintained in ensuing sessions, but the Senate's action on Wednesday, voting a ceiling of \$1.40 for corn instead of the \$1.07 (approximate) long in effect, explained the general excitement.

The pickup in volume of new offerings, even though it is nothing spectacular, is encouraging to becalmed bond men. Largest single factor in new financing plans, of course, is the excellent bond market with rates that are enticing to borrowers. Then, too, many potential issues now are talked of as a result of the gradual dissolution of the big utility holding companies under the Public Utility Act's death sentence; the long rise in common stock prices helps to reconcile the utilities to selling some properties.

• **Element of Unreality**—And there is bunching of issues that gives the market an illusory appearance of activity. New financing has to be accomplished between the enormous government bond drives because (1) the Treasury operations drain off a large part of the available investment money, and (2) the financial district is too busy helping Uncle Sam dur-

ing the campaigns to do much business on its own.

Whittling down of the utilities has brought to light plans such as that of Electric Power & Light to dispose of its holdings in Idaho Power Co.; proposed recapitalization would make this a \$50,000 common-share deal.

• **Wider Rift on Bids**—The controversy over whether or not there should be competitive bidding for the \$28,000,000 Pennsylvania, Ohio & Detroit R.R. bonds (BW-Jul. 3 '43, p102) entered its final stage with hearings before the Interstate Commerce Commission this week. Meanwhile, Gulf, Mobile & Ohio announced plans to sell \$15,400,000 of bonds competitively as part of a \$19,000,000 re-funding program.

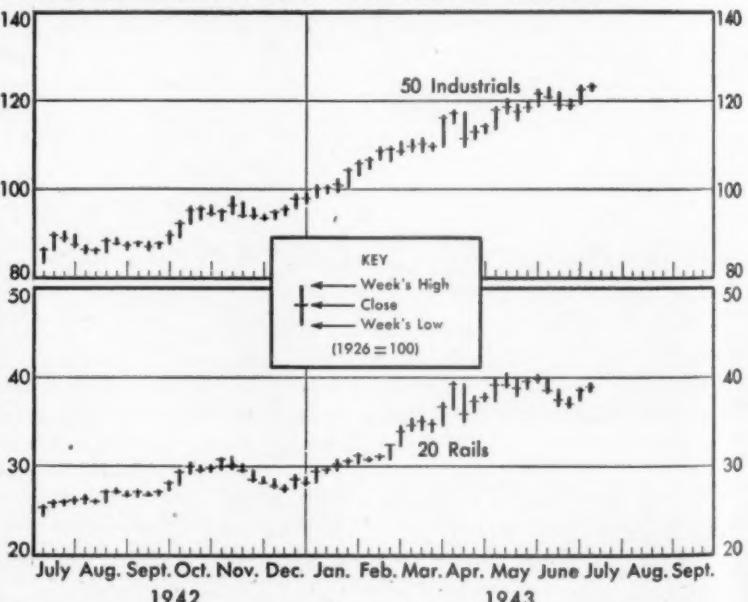
Other pending corporate business includes \$20,000,000 of bonds and preferred for California Electric; refunding of United Drug's \$30,000,000 of 5% debentures; probable sale of the Alien Property Custodian's holdings of General Aniline & Film; the \$44,000,000 refunding of Utah Power & Light; and a similar \$45,000,000 program for Northern Indiana Public Service.

Security Price Averages

	This Week	Month Ago	Year Ago
Stocks			
Industrial	123.1	122.5	120.8
Railroad	38.9	38.7	38.6
Utility	50.5	49.1	47.2
Bonds			
Industrial	116.8	117.1	116.5
Railroad	99.6	99.6	98.5
Utility	114.9	114.7	114.4
U. S. Govt.	113.4	113.2	112.7

Data: Standard & Poor's Corp. except for government bonds which are from the Federal Reserve Bank of New York.

COMMON STOCKS—A WEEKLY RECORD



Data: Standard & Poor's Corp.

1942, when the new policies went into effect. Technically, any damage since then in the territory occupied by the Japanese isn't covered, but Congress probably will provide for it later.

• **Average Rate 11¢ per \$100**—In comparison with rates quoted by private companies before the government got into the field, WDC rates are low. They begin at 5¢ per \$100 value for growing crops and range on up, but the average is around 11¢ per \$100.

Property owners thought this was fair enough last summer when most of them were dithering about air raids. Since then, however, two main kicks have developed: (1) A good many policyholders want the premiums cut or the coverage extended without charge, on the ground that WDC hasn't had to pay any losses, and (2) property owners in the interior think they should get lower rates than the coastal states which presumably run a greater risk of damage from bombing and invasion.

• **Deaf Ear on Rates**—On the question of cutting rates, WDC says firmly, "No." It thinks the rates are low enough already, and it knows that it is assuming risks that no private company or group of private companies would dare take on. One real air raid on a district of concentrated property value would use up all the \$124,000,000 WDC has accumulated and dig deep into the \$1,000,000,000 additional backlog authorized by Congress.

There's no way of calculating the risk or estimating the amount of probable loss. Hence, WDC figured that the only thing to do was fix an arbitrary rate and stick to it.

• **What's the Criterion?**—The same thing goes for establishing differential rates in various parts of the country. Nobody can say that Grand Island, Neb., is exactly 10% or 15% safer than Staten Island. Probably it is, but there isn't any way of making an estimate of the degree of risk.

Actually, war risk coverage is not insurance at all. It is a handy way of assessing all property owners and (if the damage is great) all taxpayers with the cost of the destruction instead of letting it fall haphazardly on the man whose property gets bombed. Hence, rates are uniform, regardless of differences in probable risk.

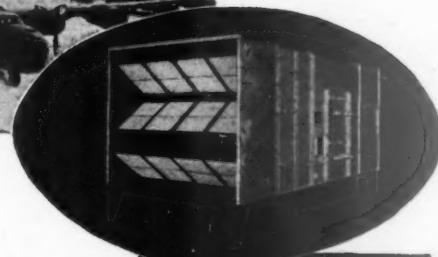
• **No Job after the War**—If WDC comes out with a profit at the end of the war, Congress will have to decide what to do with the balance. A subsidiary of the Reconstruction Finance Corp., WDC has no peacetime function. Unless Congress assigns it a new job, its assets probably will revert to the general fund.

Under an agreement worked out last spring (BW—Jun. 13 '43, p24), the private fire insurance companies will assume 10% of the loss or take 10% of the profits up to \$20,000,000. The balance

WORLD'S LARGEST "Controlled Conditions" Plant ...uses "Buffalo" FANS and AIR WASHERS



"Controlled Conditions" Plant designed by the Austin Company.



The machine-made "weather" in this vast aircraft production plant plays a major role in keeping Victory planes moving down the assembly at record pace... Here, under ideal, unvarying conditions of light, heat, humidity, and fresh air, skilled workers perform at top efficiency—regardless of the time of day or night, or of outside weather... Here is another contribution of Buffalo Air Handling Equipment to the Victory drive!

Above center: Buffalo "PCLW" Cabinet for complete conditioning of air, including heating or cooling, humidification and air filtering.

Above: Buffalo Limit-Load Fan for efficient, low-cost air handling.



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of the profits will not be earmarked. • How Companies Are Paid—So long as there are no air raids, WDC's biggest expense will be reimbursement to private companies and salesmen for costs of writing the coverage. WDC has no field staff, but 546 fire companies and their 150,000 producers act as agents. The companies get their costs up to 3½% of the premium.

Most of them are bending over backwards to avoid any charge of profiteering and take only out-of-pocket costs, returning the rest of the 3½% to WDC. Salesmen get 5% of the premium with a minimum of \$1 and a maximum of \$1,000 for each policy.

SEC Starts Fight

Commission gives charges against Investors Syndicate to the press before going to court and draws sharp retort.

Bigest case of its kind, said the Securities & Exchange Commission as it flung charges of "gross mismanagement and gross abuse of trust" and a freeze order at the Investors Syndicate group of companies in Minneapolis. And it might have forecast that the case would prove one of its most hotly contested.

• Newspaper Debate—The Investors Syndicate people caught the ball on the first bounce, snapping back at SEC that they didn't "believe that an action of this kind should be tried in the press," but noting that they were forced to answer in the papers because the commission had issued its news stories before even going into court.

The company assured its "quarter of a million certificate holders residing in every state in the Union and in every province in Canada" that the total amount that could have been demanded of the investment concern on May 31 was \$143,746,532.29, and that liquid assets exceeded this figure by more than \$28,500,000.

• SEC's Allegations—The SEC's statement attacked the group for what it described as "sales switching" between the parent company and two subsidiaries, for allegedly excessive loading deductions, fees, charges, and selling commissions, and for "misrepresentation of material fact" and "omission to state material facts."

Its freezing order, the SEC said, was necessary to prevent the defendants "from profiting by any change in the position of certificate holders." The commission is asking the courts to restrain the companies from paying cash surrenders and loans to certificate holders and to impound incoming payments from certificate holders.

THE TRADING POST

In Behalf of Enterprise

In view of the beating that business and business men have taken during the last ten years from a variety of critics both inside and outside the government, we are bound to take notice when a business man of substantial stature backs away from his day-by-day operations long enough to take an objective view of what it is all about. And it is heartening to learn that his survey leaves him with a reasoned philosophy of business, which, on all essential points, confirms the instinctive feelings of any fairly intelligent business man.

Such a helpful service has been rendered by Edgar M. Queeny, chairman of the board of Monsanto Chemical Co. and author of "The Spirit of Enterprise," just published by Scribner's.

In his preface, Mr. Queeny tells how he came to write his book. Like many another business man, he was disturbed by the wholesale criticism of business. But he found "that to breast such an avalanche, much more was needed than offhand views of one indoctrinated with a laissez-faire philosophy, particularly one whose recent studies had consisted in too great part of balance sheets, production reports, and legalistic briefs to be laid before our new administrative tribunals. These challenges," he decided, "called for a re-appraisal of one's past credo and a re-orientation as of today."

His book reflects his effort to do exactly that. It traces the process by which he examined the criticisms, appraised the critics, and renewed his own faith in the American spirit of enterprise. Any business man who will invest the brief time necessary to read this book will learn a lot about himself and the system under which he works. He will get a quick picture of how our country climbed to its high place among the nations and will note some of the evils entailed by our swift progress. He will learn how those evils fed the reaction that we call the New Deal and how that reaction has been shrewdly channeled toward objectives that have little to do with the correction of evils.

But Mr. Queeny clearly is not one of those who condemn the New Deal, its champions, and all its works without discrimination. He distinguishes sharply between objectives and methods. "Many business men," he reminds us, "are in wholehearted sympathy with what they suppose are the New Deal objectives of fuller life for the underprivileged, but are fervently convinced that New Deal methods will not obtain the objectives." He pays his respects to one of the least attractive of those methods in his

chapter on "The Inquisition." It reviews the tactics employed by those who used the hearings of the Temporary National Economic Committee, better known as TNEC, to spread before the people a warped and deceptive picture of business processes. But even here Mr. Queeny recognizes that "not all the testimony before the TNEC was onesided." Some of the monographs he rates as excellent, all as worth reading by the business man. Had these studies been objective and impartial, he concludes, they would have been invaluable to generations of economists.

But this business man is not content to remain on the defensive. His concluding chapters offer an alternative to the regimented America proposed by the "economic planners" and a vision of what may yet be achieved for the people by the spirit of enterprise working through the American system. To help realize this, he reminds his fellow business men that they "should be willing to accept more of the classic conception of the free enterprise system . . . and recognize the justice of much well-deserved though misdirected criticism by New Dealers. . . . They should be willing to have all conditions necessary to a free market restored and to provide the people with the full advantage of competition."

To that end he would strengthen the antitrust laws and eliminate the influence of the pressure groups that aggravate so sorely our national disorders. Taxes, he contends, should be reconsidered on the basis of what types and rates will bring in over the long pull the greatest well of potential revenue. He suggests other specific measures as likely to help revive the spirit of American enterprise. And this can be done, he believes, without abandoning any of the publicly expressed social aims of the New Deal, which he expects to "leave an enduring appreciation of its moral and spiritual pronouncements."

Mr. Queeny records throughout a powerful exception to the basic New Deal tenet that our economy has reached maturity. He points out that "we are rich in material things only by comparison with other nations and with the past. The possibilities of the future, now that industry has embraced science, are so limitless that only one forecast can be made with certainty—that the most extravagant prophecy will fall short of potential accomplishment!"

Any business man who will give this book a thoughtful reading is sure to strengthen his own faith in what the American enterprise system has done and can yet do to advance the wellbeing of the American people. **W.C.**



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THE TREND

WAR'S IMPACT ON REGIONAL MARKETS

Trends in regional income are of obvious interest to the business man or marketing specialist: Sales organization, promotional effort, and product development are affected by them. They are no less interesting to the economist, for where regional transformations mean market shifts, they may also mean net new investment opportunities. And changes in widely disproportionate state per capita receipts may signify as much for the economist's spending-savings breakdown of the national income as they do for the sales managers' pricing policies.

• The first thing is to get to the difficult facts. These reveal two outstanding trends: (1) The 1939-1942 changes in regional income accelerated tendencies under way between 1929 and 1939; (2) relative to the rest of the nation, the low-income states are improving their percentage position, though not their dollar one.

Thirty-one states did better than average between 1929 and 1939; of these, 23 continued to do so through 1942. Seven were far western states; ten were southern ones. Altogether, the 23 boosted their share of the national income from 32% in 1929 to 36% in 1939, to 40% in 1942. Contrariwise, of 17 income laggards during 1929-1939, nine trailed the average during the war; of the eight exceptions, four recovered from previous dust-bowl weather, and four recouped as a result of war stimulus to the South. Big, old manufacturing states dominate this "worst" category—Massachusetts, New York, Pennsylvania, Illinois. And the group's income share dropped from 45% in 1929 to 42% in 1939, to 37.5% in 1942.

As for per capita income, the twelve lowest ranking states of 1939 have advanced an average 85%, while the top twelve have increased only 53%. Of the 25 states that are up most sharply, 17 stood in the bottom half of the 1939 per capita income scale. But rankings were not much changed between 1939 and 1942, because dollar spreads widened in spite of the percentages. One example serves: Mississippi's dollar per capita gain of \$206 (from \$201 to \$407) was less than New York's gain of \$302 (from \$804 to \$1106), even though Mississippi's percentage rise was 103% to New York's 38%.

• With the statistical trends drawn, the natural questions are: How permanent are these trends apt to be? What factors brought them about? In short, why is page 78's map colored as it is? The answers lie in the table on income sources.

Approximately average in their income gains were the black-striped states (e.g., Ohio). Among the states with "blacker" income records, all sources of income lagged in the Northeast (e.g., New York); above-average farm gains failed to offset below-average advances in manufacturing and government payrolls in the Midwest (e.g., Wisconsin) and in the Mountain States (e.g., Colorado).

Red-tinted states with superior wartime income gains

break down into four groups. Industrial Connecticut, Indiana, and Michigan are dominated by heavy-goods fabricating and machining, and so proved most adaptable to, and expansible in, a war economy. Five midwest agricultural states, four formerly dust-bowl states, were boosted by extraordinary increases in farm receipts. Seven far western states experienced above-par gains in farm, government, and especially industrial income. And the stimulus of military camps, transmitted through government payrolls, was the chief factor in lifting ten southern states' gains above average. Farm receipts contributed only in Mississippi; manufacturing helped in Maryland, Alabama, and Texas; construction lent a hand in Virginia, Arkansas, and Mississippi.

Looking at it another way, the military impetus has primarily been concentrated in the South and West—areas of favorable climate for camps. Farm gains have been above average all through the Midwest and West, but not in the East or South. And, though the West and South have had a more than proportionate share of the new plants built during the war, the older manufacturing regions have increased operations in formerly under-utilized plants sufficiently to hold approximately the same regional shares of manufacturing activity.

• Clearly, postwar regional income distributions will depend in large measure upon the level of over-all economic activity, upon the relative values placed by the economy on manufacturing or agriculture or service lines, and upon similar nonregional factors. The South, for instance, will not benefit as much from military payrolls as at present, though our armed forces will tend to be larger than before the war. Similarly, while the midwestern and western sections probably will continue to enjoy agricultural advantages, the benefits are not apt to be in the same degree. And as for industry, those portions of the new plant built in the South and West which are readily convertible to peace should give those sections a somewhat improved position.

All in all, part of the 1939-1942 shifts will be maintained and part will disappear. The war has wrought no revolution in regional income, but it has reinforced the trends of the 'thirties. And from what signs can be read now, those trends are apt to continue in the postwar world.

• But it should be noted that Washington policy with regard to public power, regional freight rates, the farmer's economic position, and similar questions has played as large a part in determining regional income trends as the economics of resource use, technological change, and population shifts. Nor is there any escaping the importance of government's role in the future—though this is one regional factor which it may be much more difficult to foresee.

The Editors of *Business Week*

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